

Constructing An Arabic Language Version of the Stress Overload Scale (SOS).

Luma E. Bashmi²⁰ & James H. Amirkhan²¹**Abstract**

Arabic-speaking populations suffer from unique stressors including but not limited to acculturation, making it more crucial than ever to have a validated tool to measure stress in this population. The Stress Overload Scale (SOS), which measures stress perceived as overwhelming relative to one's resources, has proven effective in predicting illness in English-speaking populations; but no Arabic version of the 30-item SOS yet exists. The current study aimed to construct an Arabic SOS, and determine if it maintains its validity in native Arabic speakers in the United States. The 30-item SOS was translated into Arabic using the Cross-Cultural Adaptation method, including back translation. The sample consisted of 90 native Arabic speakers, aged 18 years and over from a large public university, who completed the measures online. The Arabic SOS demonstrated construct and criterion validity by showing significant positive correlations with the Arabic Perceived Stress Scale and the Patient-Health Questionnaire-15, respectively. Limitations of this study and suggestions for future validation in different Arabic-speaking samples and settings are discussed. It is concluded that the Arabic SOS may offer a better tool for evaluating pathogenic stress in Arabic-speaking populations than current existing measures.

Keywords: Stress Overload Scale; Arabic-speaking populations; construct and criterion validity.

**بناء النسخة العربية لمقياس الشحنة الزائدة للضغط.
لوما باشمي و جيمس أميرخان**

ملخص

تعاني المجتمعات العربية من عوامل ضاغطة تشمل ليس فقط الثقافة، وهذا يجعل الحاجة ماسة أكثر من أي وقت مضى إلى أداة لقياس الضغط لدى هذه الفئة. ومقياس الشحنة الزائدة للضغط الذي يقيس الضغط الذي يتجاوز موارد الفرد، أثبتت فعاليته في التنبؤ بالمرض في المجتمعات الأنجلوساكسونية، لكن لا توجد نسخة عربية للمقياس الذي يتشكل من 30 بنداً. وترمي الدراسة الحالية إلى بناء مقياس عربي للشحنة الزائدة للضغط، وتقييم ما إذا كان يحتفظ بصحته لدى عينة عربية في الإمارات العربية المتحدة. وقد ترجم مقياس الشحنة الزائدة للضغط الذي يتكون من 30 بنداً إلى العربية باستعمال منهج التكيف العبرثقافي، بما في ذلك الترجمة الراجعة. وتشكلت العينة من 90 مبحوثاً عربياً عمرهم بين 18 سنة فما فوق ينتمون جامعة عمومية كبيرة، والذين ملؤوا الاستمارات على الإنترنت. وأظهر المقياس العربي للشحنة الزائدة للضغط صحة البناء والمعيار، إذ كانت هناك ارتباطات موجبة ودالة بمقياس الضغط العربي وباستمارة صحة المريض (الذي تتضمن 15 بنداً) على التوالي. وقد تمت مناقشة محدودية هذه الدراسة واقتراحات توكيدها مستقبلاً لدى عينات عربية مختلفة. وخلصت الدراسة إلى أن المقياس العربي

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للشحنة الزائدة للضغط يوفر أداة جيدة لتقييم الضغط المرضي في المجتمعات العربية أكثر من القياسات الحالية.
الكلمات المفتاحية: مقياس الشحنة الزائدة للضغط؛ المجتمعات العربية؛ صحة البناء والمعيار.

Introduction

The Stress Overload Scale (SOS; Amirkhan, 2012; Amirkhan, Urizar, & Clark, 2015) has demonstrated effectiveness in predicting pathology in English-speaking populations. But no Arabic version yet exists. The current study aimed to construct an Arabic SOS, and determine if it maintains its validity in native Arabic speakers in the United States.

In order to assess its validity, several validity criteria were determined. First, a test of factor structure was run to assess whether the underlying factors of the Arabic SOS paralleled the original version (Personal Vulnerability and Event Load). Second, the Arabic Perceived Stress Scale (PSS-10; Chaaya, Osman, Naassan, & Mahfoud, 2010) has been a widely used stress measure in Arabic-speaking populations. As such, the Arabic PSS-10 was used as a peer measure to test for the construct validity of the Arabic SOS. Third, illness is often used as a criterion for testing the validity of stress scales (Amirkhan, 2012) and has been used to show the validity of the SOS (Amirkhan et al., 2015). The present study aimed to use the PSS-10 to test for the construct validity of the SOS and use a checklist of somatic symptoms to test for its criterion validity.

Stress Overload

The origin of the main independent variable in this study, stress overload, can be traced back to the stress concept in the early 1980s when researchers began looking at stress as a more psychological than physiological phenomenon. Several theories followed this model that stress overload is the result of both increasing demands and diminished resources. For example, Lazarus and Folkman's (1984) cognitive-transactional model proposed that stress is the relationship between an individual's perception of a stressor as exceeding his or her available resources and endangering his or her well-being. In his Conservation of Resources theory, Hobfoll (1989) suggested that individuals seek to acquire and maintain resources; stress is caused by a loss (or threat of loss) of these valued resources.

Stress Versus Stress Overload

Stress is a common emotion experienced by most individuals, and acute or short-term stress can even be considered healthy and saves lives in certain situations (McEwen, 2004). On the other hand, stress overload—stress that a person perceives as overwhelming due to a lack of adequate resources—can produce pathology, both somatic and mental (Amirkhan, 2012; S. Cohen, Janicki-Deverts, & Miller, 2007; Lazarus & Folkman, 1984).

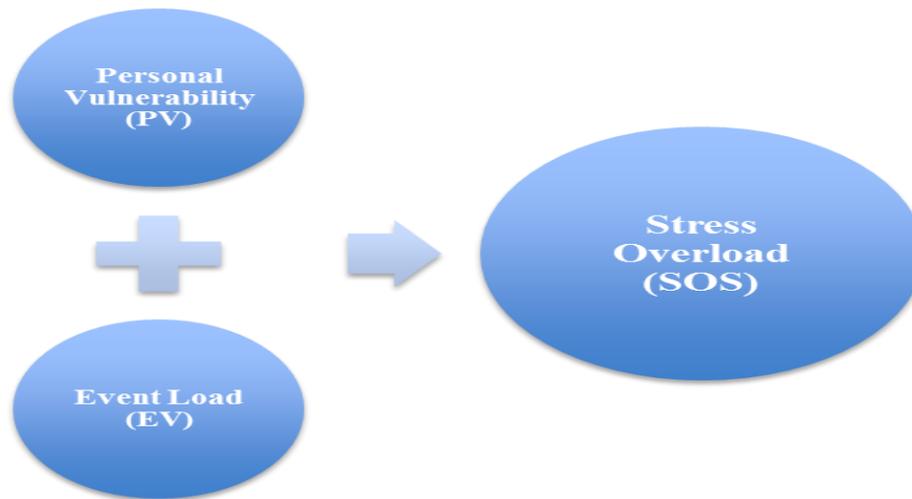


Figure 1. The components of the SOS (Amirkhan, 2012). Adapted from “Stress Overload: A New Approach to the Assessment of Stress.”

Stress and stress overload are very distinct concepts that vary both conceptually, and in the method they are measured. Stress differs from stress overload first in its definition. Stress is typically defined either as perceived vulnerability to external demands or perceived demands, but rarely both (Amirkhan, 2012; S. Cohen, Kamarck, & Mermelstein, 1983). In contrast, stress overload is composed of both of these distinct but correlated constructs (Amirkhan, 2012; Amirkhan et al., 2015). Second, stress differs from stress overload in the method of measurement. In the existing literature, stress was either measured according to its symptoms (e.g., feelings of anxiety, depression, loss of appetite, or fatigue) or precipitating life events (e.g., death or illness in the family, major deadline at school, or combat). In contrast, stress overload is measured in terms of perceived inability to meet perceived demands. The authors of a stress overload scale argued that it is more closely aligned to theories of pathogenic stress (such as that of Lazarus & Folkman, 1984), and thus more accurate in predicting illness than traditional stress measures (Amirkhan, 2012; Amirkhan et al., 2015).

Arabic-speaking populations have recently faced significant stressors, including assimilation into new countries and cultures, and consequently a number of illnesses and diseases have surfaced in this population (Ghoneim & Vyas, 2012; Odeh Yosef, 2008). Yet, virtually no studies have assessed the prevalence of stress overload and the related psychological and somatic health symptoms in this population.

Need for Stress Measures for Arabic-Speaking Populations

Arabic-speaking people are becoming a significant part of the United States and world population, with an estimated 300 million native Arabic speakers comprising 3.8% of the world’s population. Arabic currently ranks fifth in the world’s league table of languages and is predicted to become the third most

spoken language after Chinese and Urdu by 2050 (Graddol, 2004). It is also the main language of Islam, the second largest religion in the world with approximately 1.6 billion Muslims (Pew Research Center Forum on Religious & Public Life, 2009). In 2009, Arabic speakers represented almost one million of the United States population, an increase of 288% since 1980 (Crittenden, Al-Mohannadi, Cunha, Khader, & Premjee, 2016). With continued political instability in the Middle East and North African region and greater economic opportunities in the United States and other parts of the world, the number of Arabic-speaking immigrants will continue to increase (Zong & Batalova, 2015). And for those who face assimilation and other cultural changes, a significant number of these Arabic speakers are suffering stress and stress-related illnesses (Ghoneim & Vyas, 2012; Odeh Yosef, 2008).

Although there is a large literature in English-speaking populations on the link between stress and psychological and somatic symptoms, there is relatively little information about this link in Arabic-speaking populations (Chaaya et al., 2010; Crittenden, Al-Mohannadi, et al., 2016; Crittenden, Al-Sulaiti, et al., 2016; Yacoub, Alkharabsheh, Zaitoun, & Al-Atiat, 2013). What is known is that, in addition to political instability in their country of origin, this population is faced with other stressors: prejudice and discrimination after the events of September 11, 2001, challenges of assimilating into a new country and culture, difficulty accessing health care (e.g., lack of insurance and availability of mental health providers who are culturally skilled), language barriers, and religious and cultural values and practices that may contradict with Western values and practices (Mahmoud, Staten, Hall, & Lennie, 2012; Wrobel, Farrag, & Hymes, 2009). There is also evidence that these stressors have led to an increase in stress levels, post-traumatic stress disorder, depression, cardiovascular disease, diabetes, hypertension, and cancer (Constantine, Okazaki, & Utsey, 2004; Ghoneim & Vyas, 2012; Hassouneh & Kulwicki, 2007). For Arab college student populations, the adjustment to a foreign environment can be particularly difficult, leading to additional psychological and somatic symptoms, including feelings of homesickness, isolation, loneliness, inadequacy, and in some severe cases, hopelessness and helplessness, which may indicate depression (Ahmed, Kia-Keating, & Tsai, 2011). Physical manifestations of this adjustment include headaches, ulcers, immune system impairment, lack of appetite, trouble sleeping, low energy levels, and gastrointestinal problems (Elzubeir, Elzubeir, & Magzoub, 2010; Mori, 2000).

Evidence of a combination of stressors and stress-related psychological and somatic symptoms in Arabic-speaking populations makes it necessary to have a reliable and valid stress measure, yet very few stress measures exist in Arabic. Moreover, no research to date has assessed stress overload in Arabic-speaking

populations. In fact, there are few validated tools for measuring stress in Arabic-speaking populations (Alsayah, Ishaque, Lau, & Johnson, 2013). One of these measures is the PSS-10 (S. Cohen et al., 1983; S. Cohen & Williamson, 1988).

Studies Using the Arabic Perceived Stress Scale (PSS-10)

The PSS-10 appears to be the most widely used stress measure in Arabic-speaking populations, but it may not be the most valid and reliable option that currently exists (Almadi, Cathers, Hamdan Mansour, & Chow, 2012; Chaaya et al., 2010). The original PSS-10 is in English, a 10-item subjective measure of perceived stress that measures one's own perception and appraisal of life events as stressful in the prior month on a 5-point Likert scale, with good test-retest reliability and validity (S. Cohen & Williamson, 1988). The scale is composed of five negatively worded items (e.g., "felt nervous and stressed") and five reverse-keyed items about feelings and perceptions of stressors (e.g., "felt things were going your way;" S. Cohen & Williamson, 1988).

Four recent separate studies (Almadi et al., 2012; Chaaya et al., 2010; Crittenden, Al-Mohannadi, et al., 2016; Crittenden, Al-Sulaiti, et al., 2016) selected the PSS-10 to measure perceived stress in their respective populations, including high school teachers and technical workers in Jordan, pregnant and postpartum women in Lebanon, and the most recent two covering undergraduate students in Qatar. Their findings reflected adequate Cronbach's alpha coefficients, ranging from .74 to .80, compared to the original version, which ranged from .80 to .86 (S. Cohen et al., 1983; S. Cohen & Williamson, 1988). Except for one study (Almadi et al., 2012), all studies validated the Arabic PSS-10 utilizing at least two criterion scales measuring psychological and somatic symptoms. Results showed that Arabic PSS-10 scores were significantly correlated with psychological symptoms like depression, generalized anxiety, and satisfaction with life. They were also significantly correlated with somatic symptoms from the Patient Health Questionnaire (PHQ; Kroenke, Spitzer, & Williams, 2002) and similar general health measures of health perceptions, bodily pain, physical functioning, role functioning, mental health, clinic visits, and disability days (Chaaya et al., 2010; Crittenden, Al-Mohannadi, et al., 2016; Crittenden, Al-Sulaiti, et al., 2016).

Despite such findings, it has been argued that there are limitations to the English PSS-10 scale's external validity (the extent to which results can be generalized to different populations, settings, times, and experimental characteristics) and internal validity (the extent to which a scale actually measures what it is supposed to measure; Albright & Malloy, 2000). And these limitations may extend to the Arabic PSS-10.

Limitations of Arabic PSS-10 Studies

One limitation of the studies examining the relationship between the PSS-10 and symptoms is the relatively small sample sizes. Sample sizes ranged from 38 to 59, with the exception of one study that had 268 participants, all of which were female (Chaaya et al., 2010). This raises questions about the ability to generalize PSS-10 results to the larger Arabic-speaking or general population. A second limitation lies in the structure of the original PSS-10: Its items differ in emotional valence but do not distinguish between perceived inability to cope with demands and perceived demands. The latter is made distinct in stress overload scales and is crucial in capturing the totality of the “overload” that produces illness. Third, the PSS-10 structure does not offer a diagnostic rubric for determining who is more likely to be more at risk for illness. In contrast, the SOS clearly defines four risk categories, differentiating High Risk, Challenged, Fragile, and Low Risk respondents (Amirkhan, 2012; Amirkhan et al., 2015). A fourth limitation is that the PSS-10 has no filler items, making it more vulnerable to social desirability and negative affectivity bias.

These last three limitations threaten external and internal validity and suggest that the Arabic PSS-10 may not necessarily be measuring the construct of perceived stress accurately in Arabic-speaking populations. Albright and Malloy (2000) emphasized that it is important to reduce threats to internal validity first before external validity in order to establish a theory or construct in this case. Only then can a researcher design a study using the theory to extend to other populations or situations. It is argued here that the SOS, which has already demonstrated internal and external validity in English-speaking populations, might offer a better option for an Arabic-speaking population. The present study investigated the internal validity of the SOS in this population by running a test of factor structure to determine whether the Arabic SOS paralleled the original version with two underlying factors (Personal Vulnerability and Event Load), and utilized the Arabic PSS-10 to demonstrate its construct validity and the PHQ-15 (measuring somatic symptoms) to demonstrate its criterion validity.

Translation and Adaptation Issues of Psychometric Measures

The translation and adaptation of self-report psychometric measures like the SOS can jeopardize the measure’s reliability and validity. First, a distinction needs to be made between translation and adaptation. Translation is the task of finding a word or sentence that is equivalent to the original version. Adaptation of an item involves understanding what the original phrase insinuates and fitting it to the cultural context and lifestyle (Alsayah et al., 2013; Bontempo, 1993; Epstein, Santo, & Guillemin, 2015). Second, translating from English to Arabic can be particularly problematic in that these two languages do not always have equivalent or idiomatic expressions (Epstein et al., 2015). For example, there are at least four different Arabic words for “sad” that range in

the degree and nature of sadness (e.g., “za’alan” in the Arabian Peninsula, “mish mabsoot” in Lebanon and the Levantine region, and “hazeen” or “mikta’ib” in classical and Moroccan Arabic). Another example is the English idiom “go around in circles” that does not exist in Arabic if it were literally translated. A way of adapting this idiom would be to provide a literal translation in English (i.e., to waste a lot of time and effort without making any progress) and find an Arabic version that is equivalent in meaning and relevance, such as “belif weedor” (to go back and forth, and spin). However, one method, cross-cultural adaptation, has been utilized to address these issues with translating and adapting measures from one language or culture to another and is receiving more attention in Arabic adaptations (Alsayah et al., 2013; Epstein et al., 2015; Khalailah, 2013).

One of the most common methods of incorporating both the translation and adaptation of questionnaires to Arabic (and other languages) to reduce psychometric threats has been cross-cultural adaptation (Alsayah et al., 2013; Epstein et al., 2015; Herdman, Fox-Rushby, & Badia, 1998; Khalailah, 2013). Cross-cultural adaptation (CCA) of measures is “the process of equivalence between languages [and] involves different definitions and frameworks” (Epstein et al., 2015, p. 436). As mentioned earlier, CCA involves two essential parts, the translation of the measure followed by its adaptation (Alsayah et al., 2013; Epstein et al., 2015). According to a review of CCA guidelines (Epstein et al., 2015), 31 methods of CCA were identified, all of which emphasized the importance of rigor in achieving equivalence. So how can equivalence be achieved?

Herdman et al. (1998) suggested six categories of equivalence that help achieve adequate CCA of a measure:

(1) Conceptual equivalence: Constructs have the same meaning, relevance, and importance in both cultures; (2) Item equivalence: Items are relevant and acceptable in both cultures; (3) Semantic equivalence: Meaning of the items is the same across both cultures; (4) Operational equivalence: The measure can be used in a similar way in both cultures, i.e., if the survey is conducted online, then both cultures need to be able to access it; (5) Measurement equivalence: Both measures should have adequate and similar psychometric properties (reliability, validity, etc.); and (6) Functional equivalence: All of the above five equivalences should be met by both versions equally (p. 346).

The process of equivalence generally involves four steps, which will be adopted for this study: (1) translation and adaptation; (2) review of translation; (3) back-translation; and (4) committee review (Alsayah et al., 2013; Epstein et al., 2015; Geisinger, 1994). As the purpose of the present study was to construct an Arabic SOS and determine if it maintains its validity in native Arabic speakers,

these six categories of equivalence acted as the criteria for ensuring an adequate translation of the SOS. The way in which these categories of equivalence were applied is further elaborated in the Methods section of this study.

The Present Study

The purpose of the current study was to construct an Arabic SOS and determine if it maintains its internal validity in a native Arabic-speaking sample. This was a cross-sectional quantitative study assessing the reliability of the Arabic SOS and using several validity criteria. First, a test of factor structure was run to determine whether the underlying structure of the SOS paralleled the original version with two underlying factors (Personal Vulnerability and Event Load). Second, the Arabic PSS-10 (Chaaya et al., 2010) was used as a peer measure to test for the construct validity of the Arabic SOS due to its wide use in Arabic-speaking populations. Third, illness is often used as a criterion for testing the validity of stress scales (Amirkhan, 2012) and has been used to show the validity of the SOS (Amirkhan et al., 2015). As such, illness was used to test for its criterion validity as measured by somatic symptoms.

An online survey composed of the Arabic version of the SOS (Amirkhan, 2012), the Arabic PSS-10 (Chaaya et al., 2010), and the health criterion measure, the PHQ-15 (Kroenke et al., 2002) was administered. The last part of the survey included demographic items and three open-ended questions. Native Arabic speakers were recruited from a large, public university in Southern California. Native Arabic speakers in the United States are a particularly relevant population for this study as they are under particular stress (Ahmed et al., 2011; Elzubeir et al., 2010; Mori, 2000) and they speak English, so not all survey measures had to be translated.

It was hypothesized that the Arabic version of the SOS would parallel the original English version in terms of structure (two underlying dimensions: Personal Vulnerability and Event Load) and psychometrics (reliability and validity). Second, it was hypothesized that the Arabic SOS scores and its subscales would be significantly correlated with the Arabic PSS-10, demonstrating its construct validity. Third, it was hypothesized that the SOS scores and its subscales would be significantly correlated with the PHQ-15 scores, replicating the correlations found between the SOS and somatic symptoms in English-speaking populations, as well as demonstrating criterion validity (Amirkhan, 2012; Amirkhan et al., 2015). The PHQ-15 has already been used in validation studies of the Arabic PSS-10 and was thus particularly appropriate for validating the Arabic SOS. In addition, it was expected that the Arabic SOS would be a better predictor of illness than the Arabic PSS-10.

Method

The present study was a cross-sectional quantitative study that aimed to assess the structure, reliability, and validity of the Arabic SOS in a convenience sample of native Arabic speakers in the United States.

Participants

A sample of 119 native Arabic speakers was recruited (of whom 90 completed the survey) from Arabic-speaking organizations at a large, public university in Southern California. In order to be eligible for the study, the participants (1) had to be enrolled at California State University, Long Beach (CSULB) as undergraduate or graduate students, (2) had to be at least 18 years old, (3) had to identify with Arabic culture ethnically, and (4) had to be native Arabic speakers. Native Arabic speakers who did not meet all of these criteria were not included in the study.

Measures

Stress Overload

The SOS (Amirkhan, 2012) is a 30-item scale designed to measure “stress overload,” a state in which stress occurs when demands exceed the resources available. The Stress Overload Scale items were translated and administered in Arabic (see Appendix A for the Arabic version of the SOS), as were the response scales (5-point Likert scales that ranged from 1 = not at all to 5 = a lot). The items asked participants to report on their state of thoughts, feelings, and experiences from the previous week. The items form two subscales, personal vulnerability (PV) and event load (EL). Examples of the 12 PV items include feeling “inadequate,” “confident,” and “no sense of getting ahead.” Examples of the 12 EL items include feeling “strained,” “swamped by your responsibilities,” and “like you were rushed.” The remaining items are six filler items (e.g., feeling “bored,” “generous”). Typically, subscale scores are summed into a continuous total and range from 24 (low stress overload) to 120 (high stress overload). Scores can also be measured on a categorical scale, allowing participants to be split according to one of four categories as illustrated in Figure 2: (1) High Risk (High PV/High EL); (2) Challenged (Low PV/High EL); (3) Fragile (High PV/Low EL); or (4) Low Risk (Low PV/Low EL). Group means would be used as dividing points on the PV and EL subscales, where any score above the SOS mean would be grouped under High Risk. Scores above the PV mean would be grouped under high PV and scores above the EL mean would be grouped under high EL.

		Personal Vulnerability (PV)	
		High	Low
Event Load (EL)	High	High Risk	Challenged
	Low	Fragile	Low Risk

table 1. The four risk quadrants of the SOS (Amirkhan, 2012) based on categorical scoring.

The SOS has evidence of strong internal consistency (with Cronbach's alphas $> .94$ for both subscales and the measure as a whole) and good test-retest reliability, with coefficients averaging $.75$ over one week (Amirkhan, 2012; Amirkhan et al., 2015). In addition, the scale is practical, brief, and fitting for a broad demographic range; it has been tested across diverse populations of various ages, genders, ethnicities, and socioeconomic statuses (SES), matched to United States Census proportions. Finally, the SOS has demonstrated validity across different samples and settings, predicting pathological symptoms and behaviors (Amirkhan et al., 2015). While the SOS has been translated to Spanish, Setswana (Wilson, Wissing, & Schutte, 2017), and Korean (C. Chun, personal communication, February 27, 2017), no Arabic version is yet available.

Stress

The Arabic version of the PSS-10 (Chaaya et al., 2010) was administered in the survey to demonstrate the Arabic SOS's construct validity. The original PSS-10 is an English 10-item subjective measure of perceived stress that measures one's own perception and appraisal of life events as stressful in the prior month on a 5-point Likert scale (0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often). The scale is composed of five negatively worded items (e.g., "felt nervous and stressed") and five reverse keyed items about feelings and perceptions of stressors (e.g., "felt things were going your way;" S. Cohen & Williamson, 1988). Higher scores indicate higher perceived stress. The original scale has demonstrated good test-retest reliability and validity (S. Cohen & Williamson, 1988). The Arabic version has been validated in students, postpartum women, and pregnant women with Cronbach's alpha coefficients ranging from $.71$ to $.75$, which was considered adequate. The test-retest reliability Spearman's coefficient is moderately high at $.74$ (Chaaya et al., 2010).

Health

The PHQ-15 (Kroenke et al., 2002) is a self-administered somatic symptom subscale. It was administered in English, and used as the health criterion measure to determine the criterion validity of the SOS. The PHQ-15 was selected for its high reliability and validity, its previous use in Arabic-speaking populations (Alhadi et al., 2017; Alosaimi et al., 2017), and its lack of overlap of items with the SOS (which minimizes the possibility of artificially inflated validity correlations). It asked participants about 15 somatic symptoms, 14 of which are listed in the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV; American Psychiatric Association, 2000) as the most prevalent somatic symptoms for somatization disorder. Somatic symptoms cover general health perceptions, bodily pain, physical functioning, role functioning, mental health, clinic visits, and disability days. For 13 of the items, participants were asked how much they have been bothered by any of the listed problems in the last 4 weeks

and rated the severity of each symptom on a 3-point response scale ranging from 0 (not bothered at all) to 2 (bothered a lot). Items include “stomach pain,” “back pain,” and “dizziness,” where higher scores indicate a higher severity of the symptom. For two somatic symptoms, “feeling tired or having little energy” and “trouble sleeping,” participants were asked how often they were bothered by any of these problems in the past 2 weeks. Responses were coded on a 3-point response scale ranging from 0 (not at all) to 2 (more than half the days or nearly everyday). Total scores can range from 0-30, with higher scores indicating a higher severity or frequency of the somatic symptoms.

The PHQ-15 has demonstrated excellent internal reliability with a Cronbach’s alpha coefficient of .80, and individual symptoms show only moderate associations with one another ranging from .20 to .29 (45% of symptoms) or .10 to .19 (33%). The PHQ-15 has been used in various settings and samples, including undergraduate and graduate college students, with good internal consistency and test-retest reliability, including a Cronbach’s alpha coefficient of 0.82 and an intra-class correlation coefficient of 0.87 (Lyoo, Ju, Kim, Kim, & Lee, 2014).

Demographic Items

The demographic profile questionnaire (see Appendix B) is a 16-item instrument developed by the researcher that was administered in English, at the end of the survey to avoid priming effects (Steele, 1997). Data from the questionnaire enabled the researcher to correlate specific demographic variables with other study variables. The questionnaire was designed to collect the following data: age (years), gender (male/female/other), ethnicity (Arab American/Middle Eastern/other as open-ended), country of birth, number of years residing in the United States, mother’s country of birth, father’s country of birth, number of years speaking Arabic, preferred language, language spoken at home, level of Arabic proficiency, number of units enrolled, educational level, and household annual income. These demographic items have been identified in the literature as having a significant effect on stress levels and were believed important to collect in order to control for potential confounding variables (Amirkhan, 2012; Amirkhan et al., 2015; Bayram & Bilgel, 2008; Chaaya et al., 2010).

Open-Ended Questions on Stress

In addition to the two measures of stress, three open-ended questions were added to the survey to provide the participant with the opportunity to mention any issues that were not addressed in the Arabic SOS or the Arabic PSS-10 (see Appendix B). These questions were administered in English and included: “How do you define stress?”, “What’s your major source of stress?”, and “Is there anything else you’d like to share that we didn’t ask in the survey?” The aim was to provide additional, qualitative information about the stressors faced, as well

as how stress was construed in native Arabic speakers in the United States. The literature on cross-cultural stress suggests that a mixed methods approach to collecting data may offer a way to more fully capture the concept of stress overload in a new population (Aronson, 1990).

Translation of Measures

The SOS was translated into Modern Standard Arabic (MSA) by the primary author. The primary author has had over 7 years of experience translating from English to Arabic and vice versa, with cultural knowledge in both the target (i.e., Arabic) and source (i.e., English) language. She has also had previous experience in translating psychology terminology. Modern Standard Arabic has been considered the “golden mean” in being able to meet any gaps between classical and colloquial Arabic (Mazid, 2009). With over 22 Arabic countries from different continents, four main dialects of colloquial Arabic (Gulf, Levant, Moroccan, and Egyptian), over 20 dialectical variations, more than one variety of Arabic sometimes being used within one sentence and significant differences between written and spoken Arabic, translation from English to Arabic becomes complicated. Modern Standard Arabic offers an effective medium that can be understood across the different Arabic countries as it utilizes words and grammar based on a relaxed journalistic style of writing (as opposed to Classical Arabic, the language of Islamic religion, which is more strict and resistant to change) and is influenced by foreign language. It also gets regularly updated based on changes in science, technology, idioms, and sayings (Mazid, 2009).

The method of translation used in this study was: (1) Forward-translation and adaptation: A method that applied the direct translation technique from English to Arabic by two translators (the author and an Arabic professional translator); (2) Confirmation of translation: This was done by a committee (a 6-member committee described below in the ‘Centering Process’ section); (3) Back-translation: A process in which a professional translator took the Arabic version of the survey and translated it back to English without referring to the original English version (Khalailah, 2013); and (4) Committee review: Revision and production of a final draft by the committee. This procedure has been considered adequate in meeting sufficient validity and Herdman et al.’s (1998) categories of equivalence criteria for cross-cultural adaptation purposes (Epstein et al., 2015; Khalailah, 2013).

Centering process. The main goal of the centering process was to ensure that Herdman et al.’s (1998) six categories of equivalence had been met in translating the SOS into Arabic. Epstein et al. (2015) found these categories to be adequate in evaluating a total of 31 CCA studies. A six-member committee (i.e., expert committee) of lay people and professionals reviewed the items on the Arabic version of the SOS to arrive at the best translation prior to

administering the surveys in the second step of the procedure. These members were native Arabic speakers from varied backgrounds (i.e., different regions, countries, dialects, and educational backgrounds) to ensure that the scale reflected accurate, up-to-date terminology that can be understood by a wide spectrum of the target sample.

The committee was selected based on the first author's personal contacts with Arabic native speakers in the Los Angeles area and referrals from the CSULB Arabic professor. The committee consisted of six native Arabic speakers originally with cultural knowledge in the target language, including all four Arabic dialects. Members included an Arabic professor who had taught Arabic to native English-speaking undergraduate students for at least 5 years, a professional translator with a 10-year career in translating and adapting social science-related documents from English to Arabic and vice versa; a Ph.D. student with translation experience, a professional in the creative industry responsible for translating and adapting copyright in English and Arabic, a writer and journalist who mainly publishes work in Arabic, and a graduate student studying public health. The committee met together as a focus group to review and agree on each item of the forward-translation. The first author led a focus group and went through each item of the SOS, ensuring that all members agreed with and understood the translation. Any dispute was settled by the majority, in which four out of six members had to agree on the translated item in order for it to be approved, or a new translation for that item had to be provided to which the majority agreed. If only half of the committee agreed, the author made the decision as to whether to go ahead with the existing translation or suggest new wording. After the committee reviewed this version, an independent translator back-translated the version, and then this version was again submitted to the committee for a final review. At this stage, the committee members independently reviewed the back-translation and provided final feedback through email communication. Any disputes were settled based on an agreement of the majority; if a dispute arose where only half the committee was in agreement, the author made the final decision.

Procedure

Recruitment Sites and Strategies

Native Arabic speakers were recruited from CSULB using first, convenience sampling, and then, snowball sampling (a sampling technique in which existing participants recruit acquaintances). Participants were initially recruited through university clubs, Arabic classes, and the Multicultural Center. In addition, flyers (see Appendix C) were posted on kiosks throughout the campus; these included information on the study in English and Arabic, including the title and purpose,

and the researcher's contact details. Then, at the end of the survey, participants were asked to refer Arabic-speaking acquaintances to the researcher.

A request to attend meetings was sent to the presidents of university clubs that included a large Arabic-speaking community, including the Muslim Student Association and Students for Justice in Palestine. The goal at these meetings was to describe the study to the attendees and recruit potential participants to complete the online survey. Similar requests were made to professors of Arabic classes on campus; and, if invited, the same study description and recruitment information were presented to these classes. In addition, permission to post flyers on campus was requested from the Student Life and Development office and approved. Approval letters were collected from the Multicultural Center, the Arabic professor, and the Student Life and Development office. These approvals are required addenda for the Institutional Review Board (IRB) application.

Data Collection

Once IRB approval was received (see Appendix D), an online survey was administered through the campus Qualtrics survey tool, and made available for over 1 month. This survey was released mid-semester during Spring 2017, so that participants would have already been introduced to their courses and assignments, ensuring that they were being exposed to academic stressors. The survey link was provided to all participants recruited through university clubs, centers, and classes, and those who responded to the posted flyers. Native Arabic speakers were left to decide whether or not they wanted to complete the survey. An online administration of the survey was chosen because it provided: (1) A more diverse and representative range of participants than those who attend club meetings or stay on campus after class, (2) anonymity, (3) improved accuracy and efficiency in collecting data, and (4) the option of contacting the researcher online for any questions (Reis & Gosling, 2010). It also served as an effective method for reaching the target audience as all participants already have access to the Internet in order to attend college and most are savvy users.

The Informed Consent was presented to native Arabic speakers first on the survey, outlining selection criteria, procedures, and contact information. Those who chose to participate first read the Informed Consent, and were required to click the "I agree" box before proceeding to the survey. Participants were informed that the only prerequisites for eligibility would be that they identify with Arabic culture and have a basic understanding of written Arabic. They were debriefed at the end of the survey that their responses would contribute to research towards mental health in Arabic-speaking populations, and that they may request information on the results after the study had been completed.

Those who also included their email address at the end of the survey were automatically entered into a drawing to win a US \$40 gift card from Amazon (as an incentive for participation).

The survey that followed the Informed Consent included the Arabic SOS (Amirkhan, 2012), the PSS-10 (Chaaya et al., 2010) as the concurrent measure, the PHQ-15 (Kroenke et al., 2002) as the health criterion, and the Demographics measure. The order of these measures was randomized in order to minimize order effects. The complete survey was administered at one time only and took approximately 30 min to complete. All answers were confidential and participants had the choice to leave any answers blank if they wished to do so. Surveys requested no names or identifiers other than email addresses if they wished to be entered into the drawing.

Once the survey was completed, native Arabic speakers were taken to a page to confirm the completion of the survey and requested to share the survey link with other participants who would be eligible for the study if they wished to do so.

Results

Preliminary Analyses

An a priori power analysis revealed that on the basis of the medium effect size observed in past research examining the relationship between stress overload and somatic symptoms (Amirkhan, 2012; Amirkhan et al., 2015), a sample of approximately 100 participants would be needed to obtain statistical power at the recommended .80 level (J. Cohen, 1994). A total of 119 participants took part in the study, of whom 90 participants (76%) completed the survey.

Sample Characteristics

The demographic characteristics of the sample can be found in Table 1. The majority of the sample was between 28 and 32 years old (43.2%, $M = 28.00$, $SD = 4.56$), female (60.2%), Middle Eastern (92.4%), born in Bahrain (48.9%) or Saudi Arabia (23.3%), had been living in the United States for 0 to 5 years (73.1%, $M = 7.07$, $SD = 9.88$) and speaking Arabic for 26 to 30 years (40.8%, $M = 24.11$, $SD = 9.35$) at an advanced level (63.2%). They mainly spoke Arabic at home (86.2%), held a bachelor's degree or higher (83.9%), and were heterogeneous in terms of language preference (47.1% preferred English and 51.7% preferred Arabic) and SES (representing annual incomes from less than US\$25,000 to US\$100,000 or more). Although there were nine out of 22 Arabic countries represented in the study based on participants' country of birth, two thirds of the participants came from only two countries in the Arabian Gulf. This raises questions about whether the sample was representative of the entire Arabic-speaking population.

Scale Characteristics

Descriptive statistics were calculated to determine the means and standard deviations of the Arabic SOS, PV, EL, Arabic PSS-10, and PHQ-15 scores. Mean scores were 64.72 (SD = 21.26) for the Arabic SOS, 28.60 (SD = 11.28) for the PV subscale, 36.12 (SD = 11.99) for the EL subscale, 19.61 (SD = 7.50) for the Arabic PSS-10, and 9.51 (SD = 4.50) for the PHQ-15.

These were first checked to ensure there was adequate variance on the SOS and PHQ-15 measures, specifically that there were no basement or ceiling effects that might compromise subsequent correlational analyses. As may be seen in Table 2, there was a large range, with means at mid-range and large standard deviations. This indicated that there was no concentration of scores near the top or the bottom of the range.

Table 2. Descriptive Statistics for the Arabic SOS and Its Subscales, the Arabic PSS-10, and the PHQ-15 in a Native Arabic-Speaking Sample.

	Range	Mean	SD	α	α (Original Scale)	N of Items
SOS	30 - 119	64.72	21.26	.924	.94	24
PV	12 - 59	28.60	11.28	.883	.94	12
EL	15 - 60	36.12	11.99	.883	.94	12
PSS-10	4 - 34	19.61	7.50	.872	.71 - .75	10
PHQ-15	2 - 22	9.51	4.50	.739	.80	15

Note: SD: Standard Deviation; SOS: Stress Overload Scale; PV: Personal Vulnerability; EL: Event Load; PSS-10: 10-item Perceived Stress Scale; PHQ-15: 15-item Patient Health Questionnaire.

Next, Cronbach’s alpha coefficients for the SOS and its subscales (PV and EL) were conducted to determine whether they replicated or were close to the alpha coefficients of $> .94$ found by Amirkhan (2012) and Amirkhan et al. (2015) for both subscales and the measure as a whole. Cronbach’s alpha coefficients indicated excellent internal reliability for the overall scale and very good reliability for the subscales (see Table 2). This showed that the Arabic version approximated the original SOS in internal consistency. Additionally, the Cronbach’s alpha coefficients for the Arabic PSS-10 and PHQ-15 also showed adequate internal consistency in this Arabic-speaking sample.

Possible Confounds

Zero-order correlations were calculated among the demographic items, the SOS, PSS-10, and PHQ-15 scales to determine if there were any possible confounds (i.e., demographics that correlated with the study measures, making them possible “third variables” in those relationships). These correlations (see Table

3) showed gender to covary with both the SOS and PHQ-15, making it a potential confound in relationships between those scales.

Hypothesis Tests

To test the first hypothesis regarding the factor structure of the Arabic SOS, an exploratory factor analysis (EFA) was conducted. Recommendations for an EFA included having a minimum of 300 as a sample size, however, if the items had several high factor loadings of .8 or larger, then a sample size of 150 was said to be sufficient (Young & Pearce, 2013). In this case, the sample size ($n = 90$) was considered small for an EFA. The Principal Axis Factoring method was used to extract factors, which were rotated using Promax to an oblique position. This replicated the methods used in constructing and validating the original SOS (Amirkhan, 2012; Amirkhan et al., 2015).

Table 3. Zero-Order Correlations of Demographic Items with the Arabic SOS, PSS-10, and PHQ-15.

	SOS-30	PSS-10	PHQ-15
Age	.029	.031	.001
Gender	.273*	.152	.417**
# Years in the United States	-.024	-.023	.085
# Years speaking Arabic	.029	-.105	-.003
Arabic language proficiency	-.077	-.013	-.121
Units enrolled	-.058	-.071	-.009
Education level	.232*	.149	.074
Household Annual Income	-.004	.091	.008

Note: SOS: Stress Overload Scale. PSS-10: Perceived Stress Scale; PHQ-15: Patient Health Questionnaire. * $p < .05$, ** $p < .01$.

Six factors qualified for extraction according to the Kaiser criterion (i.e., eigenvalues > 1). Together, these six factors explained 67.97% of the variance in SOS scores. However, inspection of the scree plot (see Figure 3) indicated that three factors were likely sufficient. Factor 1 accounted for 37.85% of the variance, factor 2 accounted for 9.53%, and factor 3 accounted for 6.63%.

Therefore, only three factors were rotated to oblique positions. To determine if an item loaded onto the correct factor (PV or EL), the criteria used by Amirkhan (2012) were that the item had to have a loading of .5 or more on that factor and a loading of less than .25 on the other factor. Using these criteria, 17 of the 24 SOS items loaded onto the correct factors. Factor 1 represented PV with eight of the original PV items and one EL item. Factor 2 represented EL with six of the original EL items. The third factor consisted of two of the original EL items. Factor 3 therefore represented a subcategory of the original EL scale and its

items (i.e., “strained” and “overextended”) appeared to be specific to physical strain. That Factor 3 represented a split of the original EL scale is further supported by its significant correlation with Factor 2 ($r = .37, p < .001$).

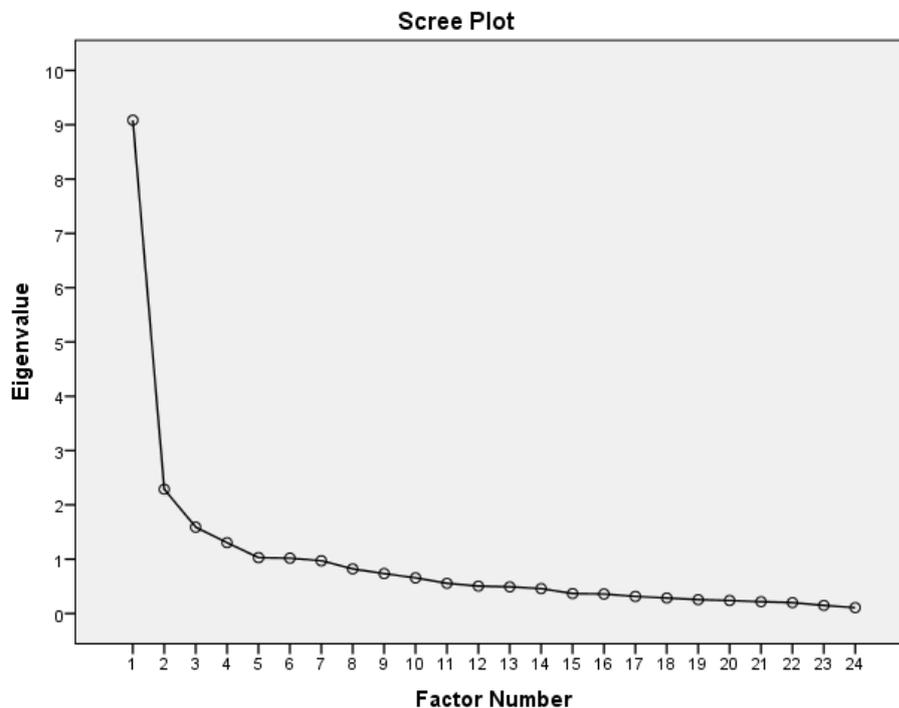


Figure 2. Scree plot showing factors derived from the Arabic SOS.

In general, the three factors proved to be inter-correlated (r 's ranging from .37 to .55), as would be expected with an oblique factor solution. Because the third factor appeared to be a measurement artifact, and because the original SOS has a two-factor structure, analyses were repeated constraining the number of factors to two.

As seen in Table 4, when the EFA was repeated with a two-factor structure, nine out of 12 items from the original EL subscale loaded onto factor 1, with strong factor loadings between .46 and .98. This reflected a clear parallel with the original EL subscale. However, three of the nine EL items did not achieve the criterion .50 loading. Factor 2 also showed a strong parallel to the original PV subscale, with 11 out of 12 PV items loading onto it, with factor scores ranging from .44 and .73; only two out of the 11 items did not achieve the minimum .50 loading.

Table 4. Factor Loadings on a Two-Factor Structure for the Arabic SOS.

Item	Original subscale	PV	EL
SOS2: “strained”	EL	.06	.46
SOS3: “inadequate”	PV	.64	-.18
SOS4: “overextended”	EL	.20	.37
SOS5: “confident” (Reverse-coded)	PV	.44	-.09

SOS7: "no sense of getting ahead"	PV	.73	-.41
SOS8: "swamped by your responsibilities"	EL	.27	.47
SOS9: "that the odds were against you"	PV	.63	.16
SOS10: "that there wasn't enough time to get to everything"	EL	-.38	.98
SOS12: "like you were rushed"	EL	.22	.28
SOS13: "like you couldn't cope"	PV	.70	.03
SOS14: "like you had a lot on your mind"	EL	-.03	.54
SOS15: "like nothing was going right"	PV	.63	.17
SOS17: "powerless"	PV	.57	.15
SOS18: "overcommitted"	EL	.14	.60
SOS19: "like your life was 'out of control'"	PV	.66	.14
SOS20: "like things kept piling up"	EL	.13	.69
SOS22: "like you had to make quick decisions"	EL	-.00	.48
SOS23: "like asking 'what else can go wrong'"	PV	.47	.21
SOS24: "like you didn't have time to breathe"	EL	-.11	.75
SOS25: "like things couldn't get worse"	PV	.58	.11
SOS27: "like there was no escape"	PV	.33	.46
SOS28: "like you were carrying a heavy load"	EL		.40
SOS29: "like just giving up"	PV	.66	-.03
SOS30: "like there was 'too much to do, too little time'"	EL	-.19	.87

Note: SOS: Stress Overload Scale; PV: Personal Vulnerability; EL: Event Load. Filler items are not represented in the table. Item 5 was reverse coded. Factor loadings in bold indicate those > .50.

In sum, only three items did not fall onto their original factors including, "there was no escape" from the original PV subscale and "overextended" and "like you were rushed", from the original EL subscale. In fact, these items failed to load onto either subscale according to the criterion that their factor loadings meet the minimum of .50. In addition, their loadings were equivalent on both subscales, indicating that these items failed to discriminate between PV and EL. To test the second hypothesis, which proposed that the Arabic SOS would reflect construct validity using a peer measure of stress, the PSS-10, bivariate correlations were calculated (Keith, 2006). These revealed that the SOS and its subscales were significantly positively correlated with the PSS-10, with medium to strong coefficients ranging from .65 to .80 ($ps < .01$, see Table 5). This supported the second hypothesis that the Arabic SOS and its subscales maintained their construct validity in terms of covariance with another measure of stress.

Table 5. Correlations of the Arabic SOS and Its Subscales and the PSS-10 and the PHQ-15

	SOS	PV	EL	PSS-10	PHQ-15
SOS	1	.908*	.919*	.796*	.498*
PV	.908*	1	.668*	.793*	.352*
EL	.919*	.668*	1	.654*	.551*
PSS-10	.796*	.793*	.654*	1	.550*
PHQ-15	.498*	.352*	.551*	.550*	1

* $p < .01$

Note: SOS: Stress Overload Scale; PV: Personal Vulnerability; EL: Event Load; PSS-10: 10-item Perceived Stress Scale; PHQ-15: 15-item Patient Health Questionnaire.

In regards to the third hypothesis, partial correlations were calculated for the SOS and its subscales with the PHQ-15, controlling for gender. This was because it was determined earlier that gender was a potential confound in tests of these two variables. Results determined that the SOS was significantly correlated with the PHQ-15 ($r = .47, p < .01$). There was also a significant positive correlation between the subscales PV ($r = .32, p < .01$) and EL ($r = .53, p < .01$) with PHQ-15. In other words, as stress overload increased, the frequency of somatic symptoms also increased. This finding demonstrated that the Arabic SOS has criterion validity in terms of its relationship with illness symptoms when controlling for gender. However, these results did not show the SOS to be a better predictor of pathology than the PSS-10, which demonstrated a comparable correlation with the PHQ-15 ($r = .55, p < .01$) when controlling for gender (see Table 6).

Table 6. Partial Correlations of the Arabic SOS and its Subscales and the PSS-10 and PHQ-15 Controlling for Gender.

	SOS	PV	EL	PSS-10	PHQ-15
SOS	1	.898*	.909*	.832*	.469*
PV	.898*	1	.633*	.792*	.315*
EL	.909*	.633*	1	.715*	.527*
PSS-10	.832*	.792*	.715*	1	.545*
PHQ-15	.469*	.315*	.527*	.545*	1

* $p < .01$

Note: SOS: Stress Overload Scale; PV: Personal Vulnerability; EL: Event Load; PSS-10: 10-item Perceived Stress Scale; PHQ-15: 15-item Patient Health Questionnaire.

As an additional test of the third hypothesis, the validity of categorical scores from the SOS was also tested. Categorical scores were calculated by splitting

each subscale at its mean (PV M = 28.60 and EL M = 36.12), and crossing the scales to form a 2 x 2 matrix. This yielded the four SOS categories: (1) High Risk (High PV/High EL); (2) Challenged (Low PV/High EL); (3) Fragile (High PV/Low EL); or (4) Low Risk (Low PV/Low EL). A General Linear Model (GLM) procedure was used to conduct a univariate ANOVA on these four categories. The GLM procedure allows for different cell sizes if there is homogeneity of variance. A Levene's Test was not significant ($p = .616$), indicating that this assumption was met. The cells did differ in size: 34.2% of the sample were classified as High Risk, 18.4% as Challenged, 9.2% as Fragile, and 38.2% as Low Risk. For the ANOVA analysis, PHQ-15 scores were used as the dependent variable and PV and EL categories (High vs. Low) as the fixed factors. This analysis showed that the interaction between PV and EL was not significant, $F(1, 75) = .310, p = .58$. A main effect for EL was found, $F(1, 75) = 14.414, p < .001$, although not for PV, $F(1, 75) = .471, p = .50$. This indicates that the SOS subscales had differential relationships with somatic symptoms.

It was expected that those in the High-Risk category would have the highest scores on the PHQ-15. Comparisons of the individual categories indeed showed that the High Risk group reported the highest number of somatic symptoms, followed by the Challenged group and the Fragile group; and the Low Risk group reported the lowest number of symptoms (see Table 7). As expected, the difference between the High Risk and Low Risk groups was significant ($t = -.556, df = 1, p < .001$), although differences between the Fragile and Low Risk groups, and the Challenged and High Risk groups, were not.

Table 7. Means of PHQ-15 Symptom Scores Predicted by Arabic SOS Categories

		Personal Vulnerability (PV)	
		High	Low
Event Load (EL)	High	11.83	11.69
	Low	8.20	6.81

Note: SOS: Stress Overload Scale; PV: Personal Vulnerability; EL: Event Load. Cells have the respective sizes of Low PV-Low EL $n = 31$, Low PV-High EL $n = 16$, High PV-Low EL $n = 5$, High PV-High EL $n = 24$.

Additional Tests

Because three of the Arabic SOS items did not load as expected, and because the ANOVA analysis showed an unexpected non-finding for one of the subscales, it was decided to perform additional validity tests using only the items that comprise the short version of the SOS (SOS-S; Amirkhan, 2016).

The SOS-Short (SOS-S) was constructed using the 10 SOS items (five PV and five EL) that had proven the strongest according to several psychometric criteria

(Amirkhan, 2016). It was developed on the premise that the original 30-item SOS could be too costly and burdensome for participants dealing with major stressors. Here, these 10 items were chosen to form a short version of the Arabic SOS.

In the current data, six out of these 10 items proved to be strong factor markers (with loadings of .50 or above of the correct factor). That there were not more may be due to the fact that two of the three problematic items on the full Arabic SOS (one PV and one EL) were not eliminated and remained on the SOS-S. Nevertheless, validity tests were repeated for this Arabic SOS-S.

Table 8. Correlations of the Arabic SOS-S, Its Subscales and the Arabic PSS-10 with the PHQ-15

	SOS-S	PV-S	EL-S	PSS-10	PHQ-15
SOS-S	1	.927**	.938**	.754**	.393**
PV-S	.927**	1	.739**	.764**	.291*
EL-S	.938**	.739**	1	.640**	.435**
PSS-10	.754**	.764**	.640**	1	.550**
PHQ-15	.393**	.291*	.435**	.550**	1

* $p < .05$, $p < .01$

Note: SOS-S: Stress Overload Scale Short; PV-S: Personal Vulnerability Short; EL-S: Event Load Short; PSS-10: 10-item Perceived Stress Scale; PHQ-15: 15-item Patient Health Questionnaire.

Bivariate correlations showed the Arabic SOS-S and its subscales to be significantly positively correlated with the PSS-10, with medium to strong coefficients ranging from .64 to .76 ($p < .01$, see Table 8). These correlations were almost identical in magnitude to those of the full Arabic SOS. On a positive note, this showed the short Arabic SOS-S to maintain the construct validity of the full Arabic SOS even after reducing it to ten items.

When controlling for gender, the Arabic SOS-S also significantly correlated with the PHQ-15 ($r = .41$, $p < .01$), but this time, the correlation was slightly weaker compared to that obtained with the full Arabic SOS. Also, only EL had a significant correlation with PHQ-15 ($r = .47$, $p < .01$) when controlling for gender, but not PV ($r = .30$, $p = .011$) (see Table 9). This finding indicated that the Arabic SOS-S has criterion validity in terms of its relationship with illness symptoms. However, the SOS-S did not appear to be any better at predicting pathology than the full Arabic SOS or the PSS-10, which yielded a comparable correlation with the PHQ-15 (PSS-10: $r = .56$, $p < .01$).

Table 9. Partial Correlations of the Arabic SOS-S and its Subscales and the PSS-10 and PHQ-15 Controlling for Gender.

	SOS-S	PV-S	EL-S	PSS-10	PHQ-15
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SOS-S	1	.926*	.937*	.784*	.413*
PV-S	.926*	1	.735*	.778*	.298
EL-S	.937*	.735*	1	.687*	.466*
PSS-10	.784*	.778*	.687*	1	.559*
PHQ-15	.413*	.298	.466*	.559*	1

* p < .01

Note: SOS-S: Stress Overload Scale short version; PV: Personal Vulnerability; EL: Event Load; PSS-10: 10-item Perceived Stress Scale; PHQ-15: 15-item Patient Health Questionnaire.

The categorical scores derived from the Arabic SOS-S were also used to test the measure’s criterion validity. Repeating the GLM procedure described previously, the PHQ-15 was employed as the dependent variable, and the SOS-S PV and EL categories were used as the independent variables in an ANOVA analysis. The result of the Levene’s Test, which tests for equality of variances across samples, was not significant (p = .291), indicating that the assumption for homogeneity of variance was met, and that the test was robust to differences in cell sizes. It was again expected that the two main effects would be significant, but their interaction would not be. Indeed, the interaction between PV and EL was not significant, $F(1, 75) = 1.992, p = .16$. As expected, EL showed a significant main effect, $F(1, 75) = 16.031, p < .001$, but unexpectedly, PV did not, $F(1, 75) = .422, p = .52$. This underscores that the Arabic SOS-S merely mirrored the validity findings for the full Arabic SOS, and did not show any improvement.

Also as expected, the High Risk group reported the highest level of somatic symptoms, followed by the Challenged group. Unexpectedly, the Fragile group had a slightly lower mean than the Low Risk group, but this difference was not statistically significant (see Table 10). The difference between the High Risk and Low Risk groups was again significant ($t = 1.397, df = 1, p < .001$), but the difference between the High Risk and Challenged groups was not.

TABLE 10. Means of PHQ-15 Symptom Scores Predicted by Arabic SOS-S Categories.

		Personal Vulnerability (PV)	
		High	Low
Event Load (EL)	High	11.83	11.69
	Low	5.40	7.85

Note: SOS-S: Stress Overload Scale Short version; PV: Personal Vulnerability EL: Event Load.

Cells have the respective sizes of Low PV-Low EL n = 33, Low PV-High EL n = 14, High PV-Low EL n = 5, High PV-High EL n = 24.

Qualitative Findings

When participants were asked to briefly elaborate on how they defined stress, the majority of them described challenges or burdens that were overwhelming, disabling, external and out of their control, and caused by a lack of time and/or energy. Second in popularity was a definition that related stress to aspects of negative thinking, such as overthinking, having too many self-defeating or destructive thoughts, and/or a lack of focus and clarity. For example, one participant stated that stress was, “Mental thought that leaves the body in a state similar to physical fatigue”. The third most popular definition of stress focused on emotions, equating stress to having feelings of anxiety, nervousness, bad mood, discomfort and/or imbalance. Based on these definitions, the majority of the Arabic-speaking sample defined stress as an experience that is influenced by external rather than internal factors, mainly out of one’s control, that leads to mental and physical anguish.

The second question asked participants to name their major source(s) of stress. The sources of stress from most to least common were: school work or work, family, the future (including uncertainty, death, unexpected events), relationships (love, partners), money, time management and deadlines, mental and physical health, work-life balance, friends, and meeting expectations (society, family, friends). These were sources of stress that are typical of Western samples (Smedley, Myers, & Harrell, 1993; Zajacova, Lynch, & Espenshade, 2005), however, there were also stressors that were unique to this sample. These included concerns about maintaining residency in the United States, living up to their family’s expectations, and being homosexual in a conservative Arab society.

The third question asked participants to share anything that was not addressed in the survey. Whilst the majority of the sample agreed that most aspects of stress were covered, there were others that some participants felt the need to mention. One participant indicated that sexual preference and LGBTQ community struggles in Arabic-speaking countries should be included. Another stated that, “For Arab youth, society and social expectation is a main source of anxiety. We have a lot of family and social related pressure and expectations which make life difficult, on top of having a normal career and life worries!” Other respondents echoed this, stating that distance from family and friends, homesickness, and lack of social support when being in a foreign country added to their stress. Several respondents mentioned that physical issues, such as dieting or pregnancy were important for the survey. Two respondents also had questions, asking how similar/different stress is to anxiety and what role depression plays in stress.

As these issues (e.g., homesickness, social support) are not addressed in either of the stress scales in this study, the qualitative element helped provide a further understanding of the stressors important to Arabic-speaking participants. It also helped offer an understanding of how stress overload is manifested in this sample. Based on the above feedback, this seemed to illustrate that Arabic speakers reported stressors that were similar to other populations, but also in some cases, unique to them. Yet, these stressors still seem to be perceived similarly (i.e., as a burden), and to have a similar impact on them as with other populations (i.e., to increase the likelihood of illness).

Discussion

Using data from a sample of native Arabic speakers in the United States, this study aimed to determine the validity of an Arabic translation of the original SOS. One of the rationales behind creating this stress measure was that the previous stress measures used in Arabic speaking populations did not differentiate between the subjective (personal vulnerability) and objective (event load) components of stress (Almadi et al., 2012; Chaaya et al., 2010). Even more importantly, previous findings for stress measures like the Arabic PSS-10 in predicting illness have been inconsistent (Almadi et al., 2012; Chaaya et al., 2010; Crittenden, Al-Mohannadi, et al., 2016; Crittenden, Al-Sulaiti, et al., 2016). This was an incentive to create and validate an Arabic SOS, which has subscales that assess both components of “stress overload”. It was thought that this measure would be particularly effective in diagnosing a population that has been subjected to political changes, wars, and emigration.

It was hypothesized that the Arabic SOS would parallel the two-factor structure and psychometric properties of the original English version. Specifically, it was expected that the Arabic SOS would be composed of two factors corresponding to personal vulnerability and event load, and with most items for each subscale loading onto the correct factor. It was also expected that the Cronbach’s alpha coefficients for the full SOS and its subscales would reflect adequate internal consistency with values paralleling those of the original SOS. These expectancies were met, for the most part. Factor analysis of the Arabic SOS suggested a two-factor structure. Although there was evidence of a possible third factor, closer inspection revealed this to be a facet of the second factor. Specifically, the third factor included items relating to physical strain, which was seen as an aspect of event load. In fact, 11 out of 12 items loaded correctly onto the PV factor, and 9 of 12 items loaded correctly onto the EL factor. Moreover, subscales derived from these factors yielded Cronbach’s alpha coefficients that showed good internal reliability, at levels comparable to the original measure.

Second, it was hypothesized that the Arabic SOS total and subscale scores would be significantly correlated with another Arabic measure of stress, PSS-10. In fact, a significant and positive correlation was demonstrated between the stress measures, indicating construct validity for the Arabic SOS.

Third, it was hypothesized that the Arabic SOS total and subscale scores would be significantly correlated with a measure of somatic symptoms, replicating the correlations found in English-speaking populations (Amirkhan, 2012; Amirkhan et al., 2015). After controlling for gender (which was identified as a potential confound), positive correlations were found between the Arabic SOS and the frequency of symptoms common to both physical and psychiatric illnesses. Similar correlations were found for each of the Arabic SOS subscales, providing strong evidence of the measure's criterion. However, the hypothesis that the Arabic SOS would be better at predicting illness than the PSS-10 was not supported.

Criterion validity was also tested using categorical scores derived from the SOS, which allowed respondents to be classified according to their risk for stress-related disorders. It was expected that participants in the High Risk category would report more symptoms than participants in the Low Risk, Challenged, or Fragile categories. In fact, the High Risk group was found to have the highest mean level of somatic symptoms, while the Low Risk group had the lowest. However, while EL had a significant main effect on somatic symptom levels, PV did not. This suggests that the components of stress overload did not relate equally to health, a finding that may be due to a cultural issue. Studies have shown that Arabic speakers are more reluctant to admit vulnerability (Abu-Ras & Abu-Bader, 2008; Abu-Ras & Suarez, 2009; Gorkin, Massalha, & Yatziv, 1985). This may explain why personal vulnerability did not have a significant effect in the present tests: If Arabic speakers were reluctant to endorse these items, this would in fact undermine the PV scale's validity.

Additional tests were run using the Arabic SOS-Short (SOS-S) to see if it could improve on the validity of the full measure. Bivariate correlations were almost identical in magnitude to those of the full Arabic SOS. Like the full Arabic SOS, the Arabic SOS-S also maintained construct validity with the peer stress measure, PSS-10, and criterion validity with illness symptoms. After controlling for gender, positive correlations were found between the Arabic SOS-S and the frequency of symptoms common to both physical and psychiatric illnesses. There was also a significant positive correlation between the EL subscale and PHQ-15, but not the PV subscale. Again, EL but not PV had a significant main effect on somatic symptom levels. Based on the correlations, the Arabic SOS-S may not have reflected an improvement in the validity of the measure, but did offer more than adequate correlations. Its ability to maintain construct and

criterion validity added to the incremental validity demonstrated by the full scale. This is especially significant since it had reduced the scale to only ten of the original 30 items. Furthermore, the SOS-S did not predict pathology any better than the full Arabic SOS or the PSS-10. An explanation for why it was not a better predictor of pathology can be attributed to the fact that the Arabic SOS-S still included two of the problematic items (one PV and one EL) from the full Arabic SOS.

Another possible explanation for why the Arabic SOS and SOS-S did not predict pathology any better than the PSS-10 could be related to translation issues rather than problems with the scale itself. For example, while the Arabic SOS and PSS-10 were administered in Arabic, the PHQ-15 was administered in English. Having the PHQ-15 administered in English might have depressed correlations with the Arabic SOS. Furthermore, the SOS was translated into MSA. Modern Standard Arabic has been considered the “golden mean” in being able to meet any gaps between classical and colloquial Arabic. The Arabic SOS was also constructed using the cross-cultural adaptation (CCA) method, attempting to achieve equivalence of meaning by applying Herdman et al.’s (1998) six categories of equivalence. This method has been supported in the literature as a reliable and valid way of translating psychometric measures, especially from English to Arabic (Alsayah et al., 2013; Epstein et al., 2015; Herdman et al., 1998; Khalailah, 2013). However, even when meeting the requirements of translation and adaptation, it is difficult to ensure consistency across over 20 Arabic dialects. The expert committee involved in the translation and adaptation of the SOS represented the four main dialects of colloquial Arabic, but only six out of the 22 Arabic countries. As such, certain items may have been lost in translation.

Study Limitations and Suggestions for Future Research

When constraining the EFA to two factors, three out of the 24 items had loadings that did not discriminate between PV and EL; this was especially problematic for event load. Again, this can be attributed to a translation issue. The Arabic translations for these may have been unclear across the sample, referencing phrases and expressions that differ across Arabic countries. For example, the Arabic translation of “like you were rushed” could be interpreted by some as “like you were unable to complete your tasks,” which could be attributed to either PV (unable to complete the task due to an internal issue) or EL (unable to complete the task due to an external issue). Future studies should consider a further revision of these items using a more varied spectrum of committee members and repeated validity tests of the Arabic SOS in more diverse Arabic-speaking samples in different geographic locations. This would

allow for a translation that more closely resembles the original version and is understood similarly among all Arabic speakers.

The current study had other possible limitations, beyond translation issues, that should be considered in the interpretation of these findings. One is that self-reported measures of stress are subject to response biases, which threaten the validity of these measures. Social desirability bias is a major problem, causing respondents to report lower levels of stress than actually experienced to avoid being seen as weak or inadequate (Aronson, 1990). Negative affectivity is another problem, with persons high on this trait more likely to endorse negative items on stress and illness measures, creating artificial validity correlations (Eaton & Bradley, 2008; Watson & Pennebaker, 1989). The English SOS has built-in defenses against such biases, such as the use of filler items. And the fact that both the English SOS and the PHQ-15 have demonstrated validity in the past suggests that they are not vulnerable to such biasing. However, whether these qualities transfer to the Arabic SOS or the SOS-S is unknown. Future studies of the translation should explicitly test for biasing, using measures of social desirability and negative affectivity. Additionally, translating the PV items using less threatening terms that involve a negative connotation may also help reduce this social desirability bias.

Another possible limitation of this study is in using an online survey to collect its data. This method was believed to be fitting for the purpose of this study because it provides for anonymity, a greater likelihood of honest responses, minimal participation from the experimenter (equating to less bias), and improved accuracy and efficiency in collecting data (Aronson, 1990; Reis & Gosling, 2010). However, it may have limited the sample to the tech-savvy, raising questions about the generalizability of the results across the full spectrum of Arabic-speaking people. Future studies may make use of hard-copy measures, or even interview methods, to ensure that the Arabic SOS is valid for non-technological segments of the Arabic-speaking population.

A related limitation is that the sample of native Arabic speakers does not accurately reflect the Arab-speaking world, both because they do not represent all variations of the language and because they are bilingual. The majority of the sample in this study also represented a much older age group (28-32 years old) with a high level of education (bachelor's degree or above), representing a generalization concern. It is recommended that the Arabic SOS be further validated in different Arabic-speaking samples and settings, such as non-bilingual Arabic speakers, pregnant women, younger age groups, and new immigrants to the United States. Future studies should also consider using a larger sample size to more accurately estimate the scale's validity.

The problem of level of acculturation among the sample is also relevant and is likely to be greater than that of the general Arabic-speaking population. Studies have illustrated that Arab-Americans with higher levels of acculturation may be protective against the effects of stressors (or high event load), such that higher levels of acculturation and event load are associated with lower levels of somatic symptoms (Ahmed et al., 2011). In addition to this, participants' cultural values and level of social support may also act as a protective factor against the effects of stressors (Hostinar & Gunnar, 2015; Ozbay et al., 2007). However, these variables were not assessed to determine if they had a significant impact on reported levels of stress and somatic symptoms in this sample. Future studies on the measurement of stress in Arabic-speaking populations should consider incorporating more sophisticated and well-validated measures of acculturation and cultural values (specifically, collectivistic values). Furthermore, due to the larger number of women, bilingual speakers, and acculturated people in this sample, the scores obtained here should not be considered norms for the Arabic SOS. It is impossible that any of these factors could have deflated or inflated to scores relative to the general Arabic-speaking population.

In terms of analyses, in certain studies, an EFA is typically followed by confirmatory factor analysis (CFA) to confirm whether the resulting factor structure from the EFA is accurate, based on existing theory. In this study, however, only an EFA was conducted, as the purpose was solely to explore whether the factors derived from an Arabic measure of stress overload were similar to those previously derived from the original English measure (Amirkhan, 2012). There was no expectation of a factor structure in Arabic, which was why an EFA was more appropriate for this study. Future studies may choose to perform CFA to examine the factor structure of the Arabic version further, and verify that it indeed captures the personal vulnerability and event load components of stress overload.

Implications

The current study has important implications for the study of stress in Arabic-speaking populations. First, being specific to stress overload, the Arabic SOS might offer a better tool for evaluating pathogenic stress in Arabic-speaking populations than current existing stress measures. Second, the study may add to evidence of the reliability and validity of the SOS in a new population representing a different ethnicity, language, and culture. Third, the current study may provide a first look at the incidence of prevalence of stress overload in an Arabic-speaking population, and offer a better understanding of how stress overload is manifested in Arabic-speaking cultures. While this is only a first step, a perfected Arabic version of the SOS would be able to categorize

respondents according to their risk level for stress-related pathology, which the Arabic PSS-10 does not do (S. Cohen & Williamson, 1988; Amirkhan, 2012; Amirkhan et al., 2015). This scale might prove especially useful in studies of Arab immigrants in the United States (of which there are only a few; Ghoneim & Vyas, 2012; Odeh Yosef, 2008) to assess the risks for illness associated with the stresses of assimilation and other cultural changes.

References

- Abu-Ras, W., & Abu-Bader, S. H. (2008). The impact of September 11, 2001, Attacks on the well-being of Arab Americans in New York City. *Journal of Muslim Mental Health*, 3, 217-239. doi:10.1080/15564900802487634.
- Abu-Ras, W. M., & Suarez, Z. E. (2009). Muslim men and women's perception of discrimination, hate crimes, and PTSD symptoms post 9/11. *Traumatology*, 15(3), 48–63. doi:10.1177/1534765609342281.
- Ahmed, S. R., Kia-Keating, M., & Tsai, K. H. (2011). A structural model of racial discrimination, acculturative stress, and cultural resources among Arab American adolescents. *American Journal of Community Psychology*, 48(3-4), 181–192. doi:10.1007/s10464-011-9424-3.
- Albright, L., & Malloy, T. E. (2000). Experimental validity: Brunswik, Campbell, Cronbach, and enduring issues. *Review of General Psychology*, 4(4), 337–353. doi:10.1037/1089-2680.4.4.337.
- Alhadi, A.N, AlAteeq, D. A., Al-Sharif, E., Bawazeer, H. M., Alanazi, H., Alshomrani, A. T., & AlOwaybil, R. (2017). An Arabic translation, reliability, and validation of Patient Health Questionnaire in a Saudi sample. *Annals of General Psychiatry*, 16(1). dx.doi.org/10.1186/s12991-017-0155-1.
- Almadi, T., Cathers, I., Hamdan Mansour, A. M., & Chow, C. M. (2012). An Arabic version of the Perceived Stress Scale: Translation and validation study. *International Journal of Nursing Studies*, 49(1), 84–89. doi:10.1016/j.ijnurstu.2011.07.012
- Alosaimi, F. D., AlMulhem, A., Moscovici, M., AlShalan, H., Alqazlan, M., Aldaif, A., & Sockalingam, S. (2017). The Relationship between psychosocial factors and cognition in Multiple Sclerosis. *Behavioural Neurology*. doi:10.1155/2017/6847070.
- Alsayah, F., Ishaque, S., Lau, D., & Johnson, J. A. (2013). Health related quality of life measures in Arabic speaking populations: A systematic review on cross-cultural adaptation and measurement properties. *Quality of Life Research*, 22(1), 213–229. doi:10.1007/s11136-012-0129-3.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, D.C.: American Psychiatric Press.
- Amirkhan, J. H. (2012). Stress overload: A new approach to the assessment of stress. *American Journal of Community Psychology*, 49(1-2), 55–71. doi:10.1007/s10464-011-9438-x.
- Amirkhan, J. H. (2016). A brief stress diagnostic tool: The short Stress Overload Scale. *Assessment*. doi:10.1177/1073191116673173.

- Amirkhan, J. H., Urizar, G. G., & Clark, S. (2015). Criterion validation of a stress measure: The Stress Overload Scale. *Psychological Assessment*, 27(3), 985–996. doi:10.1037/pas0000081.
- Aronson, E. (1990). The dependent variable. In E. Aronson, P. Ellsworth, J. Carlsmith, & M. Gonzales (Eds.), *Methods of research in social psychology* (2nd Eds., pp. 240-291). New York, NY: McGraw-Hill.
- Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology*, 43(8), 667–672. doi:10.1007/s00127-008-0345-x.
- Bontempo, R. (1993). Translation fidelity of psychological scales: An item response theory analysis of an individualism-collectivism scale. *Journal of Cross-Cultural Psychology*, 24(2), 149–166. doi:10.1177/0022022193242002
- Chaaya, M., Osman, H., Naassan, G., & Mahfoud, Z. (2010). Validation of the Arabic version of the Cohen Perceived Stress Scale (PSS-10) among pregnant and postpartum women. *BioMed Central Psychiatry*, 10(1), 111–117. doi:10.1186/1471-244x-10-111.
- Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist*, 49(12), 997–1003. doi:10.1037/0003-066x.49.12.997
- Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. *The Journal of American Medical Association*, 298(14), 1685-1687. doi:10.1001/jama.298.14.1685.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385–396. doi:10.2307/2136404.
- Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the U.S. In S. Spacapan & S. Oskamp (Eds.), *The social psychology of health: Claremont Symposium on Applied Social Psychology* (pp. 31–67). Newbury Park, CA: Sage.
- Constantine, M. G., Okazaki, S., & Utsey, S. O. (2004). Self-concealment, social self-efficacy, acculturative stress, and depression in African, Asian, and Latin American international college students. *American Journal of Orthopsychiatry*, 74(3), 230–241. doi:10.1037/0002-9432.74.3.230
- Crittenden, C., Al-Mohannadi, M., Cunha, C., Khader, A., & Premjee, N. (2016, March). Stress, mental and physical health, and social media usage among Arab-speaking undergraduates in the Middle East. Poster session presented at the 74th Annual Scientific Meeting of the American Psychosomatic Society, Denver, CO.
- Crittenden, C., Al-Sulaiti, M., Amir, F., Gaballa, A., Khader, A., & Khaled, B. (2016, March). Validity and reliability of the Arabic version of the Perceived

Stress Scale (PSS-10). Poster session presented at the 74th Annual Scientific Meeting of the American Psychosomatic Society, Denver, CO.

- Eaton, R. J., & Bradley, G. (2008). The role of gender and negative affectivity in stressor appraisal and coping selection. *International Journal of Stress Management*, 15(1), 94–115. doi:10.1037/1072-5245.15.1.94.
- Elzubeir, M., Elzubeir, K., & Magzoub, M. (2010). Stress and coping strategies among Arab medical students: Towards a research agenda. *Education for Health*, 23(1), 355-367.
- Epstein, J., Santo, R. M., & Guillemin, F. (2015). A review of guidelines for cross-cultural adaptation of questionnaires could not bring out a consensus. *Journal of Clinical Epidemiology*, 68(4), 435–441. doi:10.1016/j.jclinepi.2014.11.021.
- Geisinger, K. F. (1994). Cross-cultural normative assessment: Translation and adaptation issues influencing the normative interpretation of assessment instruments. *Psychological Assessment*, 6(4), 304–312. doi:10.1037/1040-3590.6.4.304.
- Ghoneim, R., & Vyas, A. (2012, March). A health needs assessment of Arab-Americans in the Washington, DC area. Poster session presented at the annual George Washington University Research Day, Washington, DC.
- Gorkin, M., Massalha, S., & Yatziv, G. (1985). Psychotherapy of Israeli-Arab patients: Some cultural considerations. *Journal of Psychoanalytic Anthropology*, 8, 215-230.
- Graddol, D. (2004). The future of language. *Science*, 303(5662), 1329–1331. doi:10.1126/science.1096546
- Hassouneh, D. M., & Kulwicki, A. (2007). Mental health, discrimination, and trauma in Arab Muslim women living in the US: A pilot study. *Mental Health, Religion & Culture*, 10(3), 257–262. doi:10.1080/13694670600630556.
- Herdman, M., Fox-Rushby, J., & Badia, X. (1998). A model of equivalence in cross-cultural adaptation of HRQoL instruments: The universalist approach. *Quality of Life Research*, 7(4), 323–335. doi:10.1023/a:1008846618880
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513-524. doi:10.1037/0003-066x.44.3.513.
- Hostinar, C. E., & Gunnar, M. R. (2015). Social support can buffer against stress and shape brain activity. *AJOB Neuroscience*, 6(3), 34-42. doi: 10.1080/21507740.2015.1047054
- Keith, T. Z. (2006). *Multiple regression and beyond* (1st ed). Boston, MA: Pearson Education Inc.

- Khalailah, R. (2013). Translation of questionnaires into Arabic in cross-cultural research: Techniques and equivalence issues. *Journal of Transcultural Nursing*, 24(4), 363–370. doi:10.1177/1043659613493440.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2002). The PHQ-15: Validity of a new measure for evaluating the severity of somatic symptoms. *Psychosomatic Medicine*, 64(2), 258–266. doi:10.1097/00006842-200203000-00008.
- Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.
- Lyoo, Y. C., Ju, S., Kim, E., Kim, J. E., & Lee, J. H. (2014). The Patient Health Questionnaire-15 and its abbreviated version as screening tools for depression in Korean college and graduate students. *Comprehensive Psychiatry*, 55(3), 743–748. doi:10.1016/j.comppsy.2013.11.011.
- Mahmoud, J., Staten, R., Hall, L., & Lennie, T. (2012). The relationship among young adult college students' depression, anxiety, stress, demographics, life satisfaction, and coping styles. *Issues in Mental Health Nursing*, 33(3), 149–156. doi: 10.3109/01612840.2011.632708.
- Mazid, B. (2009). The golden middle in translating from Arabic, e.g., into English. Paper presented at the 1st International Conference on Translation/Interpretation and the Impact of Globalization, Al-'Ain, United Arab Emirates.
- McEwen, B. (2004). Protection and damage from acute and chronic stress: allostasis and allostatic overload and relevance to the pathophysiology of psychiatric disorders. *Annals of the New York Academy of Sciences*, 1032(1), 1–7. doi:10.1196/annals.1314.001.
- Mori, S. C. (2000). Addressing the mental health concerns of international students. *Journal of Counseling & Development*, 78(2), 137–144. doi:10.1002/j.1556-6676.2000.tb02571.x.
- Odeh Yosef, A.R. (2008). Health beliefs, practices and priorities for health care of Arab Muslims in the United States. *Journal of Transcultural Nursing*, 19(3), 284-291. doi: 10.1177/1043659608317450.
- Ozbay, F., Johnson, D. C., Dimoulas, E., Morgan, C. A., Charney, D., & Southwick, S. (2007). Social support and resilience to stress: From neurobiology to clinical practice. *Psychiatry*, 4(5), 35-40.
- Pew Research Center Forum on Religious & Public Life. (2009). Mapping the global Muslim population: A report on the size and distribution of the world's Muslim population. Retrieved from: [http://www.pewforum.org/files/2009/10/Muslim population.pdf](http://www.pewforum.org/files/2009/10/Muslim%20population.pdf)
- Reis, H. T., & Gosling, S. D. (2010). Social psychological methods outside the laboratory. In S. Fiske, D. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology*.

- (5th ed., Vol. 1, pp. 82–114). doi:10.1002/9780470561119.socpsy001003.
- Smedley, B., Myers, H., & Harrell, S. (1993). Minority-status stresses and the college adjustment of ethnic minority freshmen. *The Journal of Higher Education*, 64(4), 434-452. doi:10.2307/2960051.
 - Steele, C. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, 52, 613–629. doi:10.1037//0003-066X.52.6.613.
 - Watson, D., & Pennebaker, J. (1989). Health complaints, stress, distress: Exploring the central role of negative affectivity. *Psychological Review*, 96, 234-254. doi:10.1037/0033-295X.96.2.234.
 - Wilson, A., Wissing, M., & Schutte, L. (2017). Validation of the Stress Overload Scale and Stress Overload Scale-Short Form among a Setswana-speaking community in South Africa. *South African Journal of Psychology*. doi.org/10.1177/0081246317705.
 - Wrobel, N. H., Farrag, M. F., & Hymes, R. W. (2009). Acculturative stress and depression in an elderly Arabic sample. *Journal of Cross Cultural Gerontology*, 24(3), 273–290. doi:10.1007/s10823-009-9096-8.
 - Yacoub, M. I., Alkharabsheh, M. S., Zaitoun, R. S. A., & Al-Atiat, E. K. (2013). The Arabic version of the Parental Stressor Scale: Psychometric properties and Jordanian parents' stress during child admission to PICU. *Journal of Research in Nursing*, 18(7), 619-633. doi: 10.1177/1744987112437158.
 - Young, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on Exploratory Factor Analysis. *Tutorials in Quantitative Methods for Psychology*, 9(2), 79-94. doi:10.20982/tqmp.09.2.p079.
 - Zajacova, A., Lynch, S., & Espenshade, T. (2005) Self-efficacy, stress, and academic success in college. *Research in Higher Education*, 46(6), 677-706. doi:10.1007/s11162-004-4139-z
 - Zong, J., & Batalova, J. (2015, June). Middle Eastern and North African immigrants in the United States. Migration Information Source. Retrieved from Migration Policy Institute website.
[http://www.migrationpolicy.org/article/middle-eastern-and-north-african-immigrants-united-states#Health Coverage](http://www.migrationpolicy.org/article/middle-eastern-and-north-african-immigrants-united-states#Health%20Coverage).

Appendices

Appendix 1

Arabic version of the Stress Overload Scale (SOS).

مقياس الضغوطات الزائدة

تعليمات

في الصفحات التالية ، سوف تجد أسئلة حول حالتك النفسية خلال الأسبوع الماضي . قد تبدو بعض الأسئلة مماثلة ، ولكن على الرغم من ذلك يرجى مراجعة كل سؤال . وتذكر انك لديك الحرية لتخطي اي سؤال أو عدم تكلمة الدراسة في أي لحظة .

معظم الأسئلة لها صناديق إجابة تبدو كالتالي :

نعم كثيراً		نعم، قليلاً	كلا على الإطلاق
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

يرجى الإشارة على مربع واحد فقط الذي يصف شعورك في الأسبوع الماضي، سواء ان كان قد مررت بهذا الشعور المذكور كثيراً ، أو ليس على الإطلاق، او ما بينهما.

و نريد منك أن تكون صادقاً قدر الإمكان في الإجابة على هذه الأسئلة . ولهذا السبب فإننا نتخذ خطوات للحفاظ على سرية إجاباتك .

يرجى متابعة الدراسة إلى الصفحة الأخيرة حتى ولو لم ترد على جميع الاسئلة، و إدخال عنوان البريد الالكتروني الخاص بك إذا كنت ترغب في المشاركة في قرعة للفوز بجائزة .

يرجى الاجابة على الاسئلة وانت تأخذ بالاعتبار اللحظات التي مررت بها في الأسبوع الماضي فقط .

في الأسبوع الماضي، هل شعرت بـ:

نعم، كثيراً			نعم، قليلاً	كلا على الاطلاق	
<input type="checkbox"/>	1. ... الهدوء؟				
<input type="checkbox"/>	2. ... الارهاق؟				
<input type="checkbox"/>	3. ... غير مؤهل؟				
<input type="checkbox"/>	4. ... الافراط؟				
<input type="checkbox"/>	5. ... الثقة؟				
<input type="checkbox"/>	6. ... الملل؟				
<input type="checkbox"/>	7. ... عدم الاهتمام؟				
<input type="checkbox"/>	8. ... مشغول /متورط بمسئولياتك؟				
<input type="checkbox"/>	9. ... أن الظروف ضدك؟				
<input type="checkbox"/>	10. ... لا يوجد وقت كافٍ للانجاز؟				
<input type="checkbox"/>	11. ... كريم؟				
<input type="checkbox"/>	12. ... كأنك مرغم على الانجاز؟				
<input type="checkbox"/>	13. ... وكأنك لا يمكنك التحمل / كان الافكار تتراكم في مخك؟				
<input type="checkbox"/>	14. ... كأن هناك كثير من الامور تشغل بالك؟				
<input type="checkbox"/>	15. ... هل تشعر بأن الامور لا تسير بالطريقة الصحيحة؟				

<input type="checkbox"/>	16. ...خالٍ من الهم؟				
<input type="checkbox"/>	17. ...بلا قوة؟				
<input type="checkbox"/>	18. ...كانك تتحمل الكثير من المسؤوليات؟				
<input type="checkbox"/>	19. ...كان حياتك خارج السيطرة؟				
<input type="checkbox"/>	20. ...كان المسؤوليات تتراكم؟				
<input type="checkbox"/>	21. ...كانك قادر على التركيز على الامور المهمة؟				
<input type="checkbox"/>	22. ...كانك مضطر لاتخاذ قرارات سريعة؟				
<input type="checkbox"/>	23. ...كالشخص الذي يسأل نفسه "ماذا سوف يحصل الآن من خطأ"؟				
<input type="checkbox"/>	24. ...لم يبق لديك وقت حتى للتنفس؟				
<input type="checkbox"/>	25. ...كان الأمور لا يمكن أن تزداد سوءاً؟				
<input type="checkbox"/>	26. ...بسلام؟				
<input type="checkbox"/>	27. ...وكانه لا مفر من ذلك؟				
<input type="checkbox"/>	28. ...كما لو كنت تحمل حمل ثقيل؟				
<input type="checkbox"/>	29. ...وكانك جاهز للتخلي عن كل شيء؟				
<input type="checkbox"/>	30. ...كان هناك الكثير من العمل والوقت غير كافٍ؟				

Appendix B.
Institutional Review Board (IRB) Approval Form.



CALIFORNIA STATE UNIVERSITY, LONG BEACH
OFFICE OF RESEARCH & SPONSORED PROGRAMS

DATE: March 16, 2017

TO: Luma Bashmi, MA

FROM: California State University, Long Beach Institutional Review Board

PROJECT TITLE: [1039900-1] Sending out an SOS: The Stress Overload Scale (SOS) for Native Arabic Speaking Students in the United States

REFERENCE #: 17-279

SUBMISSION TYPE: New Project

ACTION: APPROVED

APPROVAL DATE: March 16, 2017

EXPIRATION DATE: March 15, 2018

REVIEW TYPE: Expedited Review

This is to advise you that the Institutional Review Board for the Protection of Human Subjects (IRB) of California State University, Long Beach, has reviewed your protocol application.

Your application is approved as submitted.

Approval is for a period of one year from the March 16, 2017 and conditional upon your willingness to carry out your continuing responsibilities under University policy. If you would like to continue this research after this one year period, please submit a renewal application and an annual report to the Office of University Research two months prior to your expiration date of March 15, 2018.

1. You must clearly indicate in the header or footer of each page of your approved Informed Consent Form the approval and expiration dates of the protocol as follows: **"Approved from March 16, 2017 to March 15, 2018 by the CSULB IRB"**.
2. You are required to inform the Director or Senior Associate Director, Office of Research & Sponsored Programs, in writing (email is acceptable) or through IRBNet within twenty-four hours of any adverse event in the conduct of research involving human subjects. The report shall include the nature of the adverse event, the names of the persons affected, the extent of the injury or breach of security, if any, and any other information material to the situation.
3. You may not change any aspect of your research procedure involving human subjects without permission from the Director, Office of Research & Sponsored Programs or the Chair of the IRB. Please use the Protocol Modification Form on IRBNet to request any changes.
4. Maintain your research records as detailed in the protocol.

Constructing An Arabic Language Version of the Stress Overload Scale (SOS)

Should you have any questions about the conduct of your research under this protocol, particularly about providing informed consent and unexpected contingencies, please do not hesitate to call the Office of Research & Sponsored Programs at (562) 985-8147. We wish you the best of success in your research.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within California State University, Long Beach Institutional Review Board's records.