Articles

Psychometric Analysis of the Short-Form UCLA Loneliness Scale (ULS-6) Among Palestinian University Students

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Abstract

The purpose of this research was to analyze the psychometric characteristics of the short-form UCLA Loneliness Scale (ULS-6) among Palestinian university students. The sample consisted of 288 university students (56% women and 44% men), aged 18-22 years. The psychometric characteristics of the ULS-6 were examined using confirmatory factor analysis, reliability analysis, and criterion-related validity methods. The unidimensionality of the ULS-6 was supported among Palestinian university students. The ULS-6 showed good psychometric characteristics, with adequate internal consistency. In addition, the ULS-6 was negatively correlated with significant others support, family support, friends support, self-esteem and satisfaction with life. The results of the present study suggested that the Arabic version of the ULS-6 constitutes a concise psychometrically sound tool to assess loneliness.

Keywords: loneliness, confirmatory factor analysis, short-form UCLA Loneliness Scale, ULS-6

Loneliness is a common phenomenon. Data collected from a newspaper survey in the United States with a sample of 25,000 people showed that 78% felt lonely occasionally, 15% felt lonely most or all the time, and only 6% said they never felt lonely (Rubenstein, Shaver, & Peplau, 1979). More recently, one question statement about the feelings of loneliness was used in a sample of 384 Pakistani participants and 88.3% reported feelings of loneliness (Ahmed, Chaudhry, Afzar, & Farooq, 2015). Based on various surveys, Heinrich and Gullone (2006) concluded that "approximately 15-30% of people experience persistent feelings of loneliness" (p. 700). Loneliness is experienced by many university students (Wiseman et al., 2006) and it is one of the most prominent concerns reported by them (Nicpon et al., 2006).

There is no consensus on the definition of loneliness, reflecting the different ways in which it is conceptualized. For the cognitive perspective the loneliness involves the perception of "a discrepancy between two factors, the desired and the archived pattern of social relations" (Peplau & Perlman, 1982a, p. 5). For example, in one of the earliest definitions of this construct, Lopata (1969) defined loneliness as "a wish for a form or level of interaction different from the one presently experienced" (p. 250). According to Perlman and Peplau (1981, p. 31) "loneliness is the unpleasant experience that occurs when a person's network of social relations is deficient

in some important way, either quantitatively or qualitatively". More recently, another definition of loneliness was advanced by Asher and Paquette (2003) as "the cognitive awareness of a deficiency in one's social and personal relationships, and ensuing affective reactions of sadness, emptiness, or longing" (p. 75).

There are three relevant aspects outlined by these definitions. First, these definitions, as the majority of the definitions of loneliness, stress the perceived deficits in social relationships. Evidence has shown that loneliness is dependent on social network. When people are satisfied with their social network they are more likely to feel less loneliness. People who have difficulties getting satisfying relationships within their social network are more likely to experience maladjustments like loneliness. Second, loneliness is a subjective experience of not having the type of relationships one desires. However, it is possible to have a low frequency of social relationships without feeling lonely (Cacioppo & Hawkley, 2009; Neto, 2014b). "People can be alone without being lonely, or lonely in a crowd" (Peplau & Perlman, 1982b, p. 23). For instance, one can have many friends or a romantic relationship and still feel lonely. Third, loneliness is an unpleasant experience with potential serious outcomes (Rokach & Neto, 2005).

Loneliness has been related to poor physical and mental health (Hawkley & Cacioppo, 2010; Ó Luanaigh & Lawlor, 2008). Furthermore, it is also associated with an increased risk of suicide and mortality (Chen, Hicks, & While, 2014; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015).

Self-esteem is widely seen as indicating feelings of personal worth, constituting a core aspect of well-being. Satisfaction with life is a global evaluation of one's life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985). Past literature has revealed that self-esteem and satisfaction with life were associated with low loneliness (e.g., Ben-Zur, 2012; Goodwin, Cook, & Yung, 2001; Heinrich & Gullone, 2006; Neto & Barros, 2000). Perceived social support refers to "an individual's perceptions of general support or specific supportive behaviors (available or acted on) from people in their social network, which enhances their functioning and/or may buffer them from adverse outcomes" (Demaray & Malecki, 2002, pp. 306-307). Loneliness was found to be negatively associated with perceived support from significant others, family, and friends (Zarei, Memari, Moshayedi, & Shayestehfar, 2016).

Given that loneliness is a risk factor to the health and the well-being of people, it is necessary to develop interventions to reduce this phenomenon. Measurement of the level of loneliness experienced is necessary to develop strategies to attempt to lessen suffering in people. One way of measuring loneliness is through the use of self-report scales. Several scales have been developed to measure loneliness (Robinson, Shaver, & Wrightsman, 1991). The scales developed to measure loneliness are based either on a unidimensional or multidimensional conceptual approach (Neto, 2014a). For the former approach loneliness involves a "core sense of being lonely which is undifferentiated in nature, and is experienced and understood in the same way by all lonely people" (Allen & Oshagan, 1995, p. 185). Within this approach loneliness varies primarily in its intensity. For the multidimensional approach loneliness involves various experiences or types (e.g., Weiss, 1973; DiTommaso, Brannen, & Best, 2004). For example, Weiss (1973) described two types of loneliness: emotional and social loneliness. Emotional loneliness refers to the absence of an attachment figure and social loneliness refers to the lack of an accessible social network.

The revised University of California, Los Angeles (R-UCLA) Loneliness Scale (Russell, Peplau, & Cutrona, 1980) is one of the most widely employed measures of loneliness and has been used for several decades. Many scholars consider the R-UCLA Loneliness Scale as the most psychometrically sound measure of

loneliness available (e.g., Hartshorne, 1993). It was based on a conceptualization of loneliness "as a unidimensional emotion response to a discrepancy between desired and achieved levels of social contact" (Robinson et al., 1991, p. 250). R-UCLA revealed high internal consistency (alpha = .94) and evidenced concurrent and discriminant validity (Russell et al., 1980). Russell et al. (1980) state, "The construct validity of the revised scale is established by relating loneliness scores to the experience of affects that have been linked both empirically and theoretically to loneliness" (p. 473). The total score is related to measures of depression, social self-esteem, anxiety, and self-rated feelings of abandonment, emptiness, hopelessness, isolation, and social dissatisfaction. The discriminant validity was demonstrated as loneliness was showed to be a distinct psychological experience from social desirability, social risk taking, negative emotional rates, and affiliative motivation (Russell et al., 1980). The R-UCLA has been adapted in various cultures, such as Persan (Hojat, 1982), German (Lamm & Stephan, 1987), Portuguese (Neto, 1989), and French (de Grâce, Joshi, & Pelletier, 1993).

Although findings from past studies (e.g., Russell, 1982) showed a satisfactory internal consistency of the R-UCLA, the factor structure of this scale demonstrated to be somewhat controversial (Hartshorne, 1993). Diverse studies showed that the scale was multidimensional. For instance, Austin (1983) using principal-components analysis with varimax rotation found three factors among American college students. Knight and colleagues (1988) using a similar method found three factors among adults from New Zealand. Neto (1992) found a five-factor solution which accounted for 54.5% of the variance among Portuguese adolescents. This factor structure was very similar to that evidenced by Hojat (1982) among Iranian students.

A recent shift towards the use of measures with fewer items has occurred (Schweizer, 2011). Among the useful applications for short measures, Gosling, Rentfrow, and Swann (2003, p. 505) refer "large-scale surveys, pre-screening packets, longitudinal studies, and experience-sampling studies". In particular, a short-form of the revised UCLA Loneliness Scale (Russell et al., 1980) was developed (ULS-6; Neto, 1992, 2014a).

The ULS-6 includes 6 items (see Table 1) which were selected by means of exploratory factor analysis conducted with the items of the R-UCLA (Neto, 1992). The items selected loaded substantially on the first factor. These statements seem to include the core of loneliness conceptualised as the distance between perceived relationships and desirable relationships. The score from the ULS-6 correlated highly with the score from the longer scale (r = .87). Cronbach's alpha of the ULS-6 was .77. The ULS-6 score correlated with other psychological variables in a very similar way to the longer scale. Therefore, this economic tool of loneliness evidenced to be reliable and valid similarly to the longer scale.

The ULS-6 has been utilized primarily with youths (e.g., Neto, 1992) and university students (e.g., Neto, 2006). The ULS-6 has also been used with migrant people, presenting acceptable psychometric properties (Neto, 2002, 2016). Recently, additional empirical demonstration of the satisfactory psychometric properties of this measure was obtained among old people (Neto, 2014a).

In summary, previous studies using the ULS-6 showed adequate reliability and validity in the Portuguese culture. Evidence showed a unidimensional factor loading. The purpose of the current research is to analyse the psychometric characteristics of the ULS-6 among Palestinian university students. We are going to test the factorial structure, the reliability, and the criterion-related validity of the measure. In order to examine the criterion-related validity, correlations between ULS-6 and indicators of psychological functioning such as self-

esteem and satisfaction with life and perceived social support will be scrutinized. This set of constructs was selected because they display conceptual relationship with loneliness.

Method

Participants

The sample included 288 university students (161 females) enrolled at different faculties of An-Najah National University in Nablus, Palestine. The ages ranged from 18 to 22 years. Thirty-eight percent of the students were attending a course in science and 62% in humanities. Furthermore, 46% of the sample was living in villages, 47% in cities, and 7% in refugee camps.

Material

The material included four scales, previously adapted for a Palestinian people, and background information.

(a) The Revised UCLA Loneliness Scale (UCLA-R). The R-UCLA (Russell et al., 1980) was utilized to measure loneliness. This measure evaluates global subjective feelings of loneliness and social isolation and is one of the most widely used loneliness scales. This scale included 20 statements. Ten are formulated in a positive way (e.g., "I am an outgoing person") and 10 in a negative way (e.g., "I am no longer close to anyone"). The items are assessed on a 4-point scale ranging from 1 (*never*) to 4 (*often*). Higher values denote higher loneliness. We used the Arabic version of this scale (Al-Omari & Jaradat, 2013). Cronbach standardized alpha for the current study was .85. The ULS-6 is constituted by six items of the UCLA-R. Five are formulated in a negative way, and one in a positive way (Neto, 1992).

(b) Multidimensional Scale of Perceived Social Support (MSPSS). The 12-items MSPSS was used (Zimet, Dahlem, Zimet, & Farley, 1988) to assess social support from three distinct sources: friends, family, and significant others. The items are rated on a 7-point scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). Each of the three sources of support was evaluated by four items. Higher scores of each of the subscales indicate more perceived support. We used the Arabic version of MSPSS (Abou-Hashem, 2010). Cronbach standardized alpha coefficients for friends support, family support and significant others support were .86, .86 and .89, respectively.

c) Satisfaction With Life Scale (SWLS). The SWLS (Diener, Emmons, Larsen, & Griffin, 1985) was used to assess satisfaction with individuals' lives as a whole. The scale contains 5 items, which are rated on a 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores indicate higher level of life satisfaction. We have used the Jaradat's (2013) Arabic version of this scale. Cronbach standardized alpha for the current study was .79.

(d) Self-Esteem Scale. Self-esteem was assed using the 10-item inventory from Rosenberg (1965). The items are assessed on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Higher scores indicate higher level of self-esteem. We used the Arabic version of this scale (Ghazal & Jaradat, 2009). Cronbach standardized alpha for the current study was .74.

(e) Self-labelling item of loneliness. One question was used to assess the frequency of the experienced loneliness: "I feel lonely even with other people". The answers ranged from 1 (*never*) to 5 (*often*).

(f) Demographic Background. Information on background characteristics such as participants' age, gender, place of residence, and faculty (science or humanities) attended by students was collected.

Procedure

The questionnaires were administered in classrooms of 25 and more university students at a time. Informed consent was obtained from all students before completing the questionnaires. Students were assured that participation was anonymous and voluntary, and that they could discontinue their participation at any time. The questionnaire was administered in Arabic. This was considered an adequate procedure as all participants were fluent in Arabic. The average time for filling out the questionnaire was 20 minutes.

Data Analysis

Several data analyses were performed, such as exploratory factor analysis, confirmatory factor analysis (CFA), internal consistency, analyses of variance, and zero order correlations. The exploratory factor analysis was performed to examine the dimensionality of the R-UCLA Loneliness Scale. We used CFA to evaluate the adequacy of the one-factor-model for the ULS-6. The findings of CFA were assessed on the basis of several goodness-of-fit statistics such as goodness of fit index (GFI), comparative fit index (CFI), standardized root mean square residual (SRMR) and root mean square error of approximation (RMSEA). The use of diverse indices allows a more conservative and reliable assessment of the model fit. We performed Pearson correlation analysis to examine the correlations of ULS-6 with social support, self-esteem and life satisfaction. The data were analysed by means of the Statistical Package for Social Sciences (SPSS) version 21, except for confirmatory factor analysis. CFA was performed with Statistica (SEPATH). The significance level adopted in this study was 5%.

Results

Preliminary Analyses

As the ULS-6 was based on the R-UCLA, it was examined the psychometric properties of the R-UCLA Loneliness Scale, namely the internal consistency and the factorial structure. Cronbach's coefficient alpha of the R-UCLA was .85. To examine the factorial structure of the R-UCLA 20 items we performed an exploratory factor analysis (principal components) with varimax rotation. The number of factors was determined by a minimum eigenvalue of 1.00 or greater, followed by a minimum loading of .40 for the items in each factor. The factor analysis revealed a five-factor solution which accounted for 51.40% of the variance (see Table 2). Hence, once again the factor structure of the R-UCLA Loneliness Scale did not support the unidimensionality of this tool. It is worth to observe that four items of the Factor I are included in the ULS-6 ("I feel left out"; "I feel isolated from others"; I am unhappy being so withdrawn"; and "People are around me but not with me.").

Table 1

Means (M), Standard Deviations (SD), and Corrected Item-Total Correlations of the ULS-6 Among Palestinian Students

Items	M	SD	Corrected item-total correlations
1. I lack companionship.	1.87	.95	.41
2. I feel part of a group of friends.[a]	1.74	.93	.41
3. I feel left out.	1.95	.87	.46
4. I feel isolated from others.	1.79	.89	.55
5. I am unhappy being so withdrawn.	1.62	.88	.50
6. People are around me but not with me.	2.09	.90	.49

[a]Item should be reversed before scoring.

Table 2

Varimax Rotated Factors of the R-UCLA Loneliness Scale

Items	Factor 1	Factor II	Factor III	Factor IV	Factor V
1		.66			
2				.68	
3				.69	
4					.84
5		.55			
6		.50			
7				.47	
8				.53	
9		.59			
10			.47		
11	.54				
12	.53				
13	.76				
14	.60				
15		.66			
16	.43				
17	.50				
18	.61				
19				.77	
20			.83		
Eigenvalue	5.32	1.63	1.21	1.08	1.04
Explained variance	26.62	8.14	6.05	5.41	5.19

Factor Analysis

A CFA was performed on the raw data of the ULS-6 to test goodness of fit of the observed data for the one-factor model suggested by Neto (1992). The estimates of model fit were based on a maximum likelihood solution. No correlation between error terms was allowed. The χ^2 statistic was 21.47 (df = 9) with the χ^2/df ratio having a value of 2.39, less than 5, which indicates an acceptable fit (Kline, 2005). Examination of factor loadings showed that they ranged from .47 to .67. All were statistically significant ($p < .001$). The values of the fit indexes were GFI =.98, CFI = .96, SRMR = .04, RMSEA = .07. Overall, the fit indices indicate that the model

displayed an adequate fit for the sample (Bentler, 1990). So, the hypothesized unidimensionality of the ULS-6 was supported among Palestinian university students.

Reliability Analysis

To verify the internal consistency of the ULS-6 scores, Cronbach's coefficient alpha and item-total correlations were conducted. Cronbach's alpha was .73, and corrected item-total correlations ranged from .41 to .55 (see Table 1). The mean inter-item correlation coefficient was .31. In effect, the ULS-6 demonstrates adequate internal consistency for the sample of Palestinian participants.

Descriptive Analyses and Effects of Demographic Factors

Means and standard deviations of the ULS-6 items are presented in Table 1. The majority of the students displayed low levels of loneliness. Using one-way analyses of variance (ANOVA), the effects of gender, $F(1, 286) = 1.90$, $p = .17$, faculty, $F(1, 286) = .01$, $p = .93$, and place of residence, $F(2, 285) = 1.08$, $p = .34$, on loneliness were not statistically significant.

Criterion-Related Validity

As expected, the findings showed that the ULS-6 scores were related significantly to self-esteem, satisfaction with life and social support. In effect, the ULS-6 scores were significantly correlated with friends support ($r = -.47$, $p < .001$), family support ($r = -.48$; $p < .001$), and significant others support ($r = -.47$, $p < .001$). So higher levels of social support from all three sources (family, friends, and significant others) were negatively related to loneliness. Furthermore, the ULS-6 scores were significantly correlated with self-esteem ($r = -.54$; $p < .001$), and with satisfaction with life ($r = -.40$; $p < .001$). The less self-esteem and life satisfaction students reported, the more likely they were to be lonely. The direction of all correlations was consistent with the predictions aforementioned.

An identical pattern of correlations was found between the scores of the longer scale and this set of measures conceptually related to loneliness. The R-UCLA Loneliness Scale scores correlated negatively and significantly with friends support ($r = -.60$; $p < .001$), family support ($r = -.56$; $p < .001$), significant others support ($r = -.59$; $p < .001$), self-esteem ($r = -.62$; $p < .001$), and satisfaction with life ($r = -.46$; $p < .001$).

The relation of the ULS-6 to the longer scale was also approached. These two scales were significantly associated ($r = .87$, $p < .001$). This set of findings shows that the short form meets criterion validity standards.

One question assessing directly the level of loneliness was used in the development of the UCLA tool (Russell et al., 1978) and remains to be utilized to demonstrate whether scales proved to be valid (Hughes, Waite, Hawley, & Cacioppo, 2004; Neto, 2014a). The self-reported question about current loneliness was also used in this research and was significantly related to the ULS-6 ($r = .55$, $p < .001$).

Discussion

The results of this research indicate that the ULS-6 is a psychometrically sound tool among Palestinian university students. CFA of the ULS-6 was conducted to examine whether the one-factor model was confirmed.

This analysis showed similar results to those obtained by the Portuguese version of the ULS-6 (Neto, 1992, 2014a). The ULS-6 in this study supported the proposed one-dimensional structure. With regard to reliability, the internal consistency coefficient seems adequate (.73). This value is similar to that found in a Portuguese sample (.77) (Neto, 1992). However, it's worth to refer that there is no consensus in the literature about the appropriate alpha coefficient. For example, Cronbach (1990) recommended the alpha Cronbach to be above .80, and Nunnally (1978) considered a reliability of .90 the minimum that should be tolerated. However, Kline (2005) argued that the diverse content that includes psychological constructs means that a less stringent coefficient is more appropriate. In this line, the cut-off of .70 is often recommended (e.g., Cicchetti, 1994).

The correlation between the R-UCLA and the ULS-6 was high (.87). This value is the same found in a Portuguese sample (Neto, 1992). However, this high correlation is not in itself enough to justify the use of the ULS-6 given that the ULS-6 items are a subset of the R-UCLA.

As expected, loneliness measured with the ULS-6 evidenced significant negative correlations with self-esteem and life satisfaction. These results are consistent with past empirical research (Cacioppo et al., 2006; DiTommaso, Brannen, & Best, 2004; Goodwin et al., 2001; Neto, 1995; Pinquart & Sörensen, 2001).

For example, low self-esteem emerged as the strongest predictor of loneliness among Ukrainian migrants living in Portugal (Neto & Costa, 2015). In a meta-analytic study self-esteem emerged as one of the most powerful predictors of loneliness with a large effect size (Mahon et al., 2006). Individuals more likely to feel low self-esteem may blame themselves for having low social contact, and thus reinforce their loneliness (Perlman & Peplau, 1981).

In developing the original UCLA Loneliness Scale, Russell et al. (1978) found that loneliness was correlated negatively and significantly with self-ratings of satisfaction.

Low life satisfaction was associated with loneliness among Venezuelan migrants living in Portugal (Guédez & Neto, 2014) and among youths from returned migrant families (Neto, 2016).

In addition, the more social support students received from friends, family and significant others, the less they experienced loneliness. People receiving more support reported less loneliness (Chen, Hicks, & While, 2014; Henninger, Eshbaugh, Osbeck, & Madigan, 2016; Zhao, Kong, & Wang, 2013). In a meta-analysis social support emerged as a significant predictor of loneliness with a medium effect size (Mahon et al., 2006). This is consistent with studies which demonstrated that perceived social support is a relevant construct in reducing loneliness (Adamczyk, 2016; Chen et al., 2014). In sum, the pattern of correlations found between loneliness and self-esteem, satisfaction with life and social support is consistent with the predictions, suggesting that the ULS-6 fulfils the validity criterion.

The present study has limitations which need to be reported along with suggestions for further research. First, the assessment of the stability of the ULS-6 over time was not evaluated. Future work should yield evidence of the temporal stability. Second, loneliness was assessed with a self-report method. In future work, other methods of evaluation should be used. Third, the sample was constituted only by university students and hence was not necessarily representative of the Palestinian people. It would be important to evaluate the psychometric characteristics of the ULS-6 among more diverse Palestinian groups including samples of psychiatric and older people in order to better check for the generalizability of the ULS-6. Despite these

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limitations, the ULS-6 seems suitable for use in research and clinical work with Palestinian university students, having in mind that some caution should be recommended, given the discussion presented above about the alpha coefficient cut-off. With participants' time at a premium in most investigation, the ULS-6 represents an alternative to longer scales.

Funding

Competing Interests

Acknowledgments

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