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Depressive Symptoms in Elderly Women with Chronic Conditions: Measurement Issues

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Abstract

Objective: Depression is highly prevalent in elderly women with chronic conditions and measuring depressive symptoms is complicated by co-occurring chronic illnesses. The 20-item Center for Epidemiological Studies Depression (CES-D) Scale is commonly used with elders, but its length may result in missing data. Twelve short four to 16 item CES-D forms exist, but their psychometric properties have not been systematically evaluated.

Method: This study of 250 elderly women compared reliability and validity estimates for the 20-item CES-D and its 12 short forms; all scales used four response alternatives. The study also investigated whether women with varying numbers of chronic conditions would be similarly classified as depressed based on standardized cut scores.

Results: Cronbach's alpha was 0.84 for the 20-item CES-D and alphas ranged from 0.53 to 0.83 for the short forms. Correlations between the 20-item CES-D and the short forms ranged from 0.77 to 0.96. Using the established 20-item CES-D cut score, 12% of the elderly women would be classified with clinically significant depressive symptoms. The shortest scales (four and five item) identified the greatest percentages of women as depressed while the 16-item scale identified the lowest. All 12 short forms showed a trend where more women were classified as depressed as their number of chronic conditions increased.

Conclusion: The findings indicate a need for cautious interpretation of findings when shorter forms of the CES-D are used, particularly since shorter forms are less reliable and appear to over-identify women with chronic conditions as having clinically relevant depressive symptoms.

Keywords

depression, older adults, measurement, chronic illness

Introduction

The population of older adults is rapidly expanding (Administration on Aging, 2004; US Census Bureau, 2001, 2002, 2003). In 2000, there were approximately 35 million elders 65 years and older, accounting for 12.4% of the US population (Administration on Aging, 2002; US Census Bureau, 2001); elderly women made up 7.3% of the US population (Administration on Aging, 2004; US Census Bureau, 2001). Furthermore, this number is expected to double by the year 2030, meaning that 70 million Americans will be aged 65 years of age and above, (Administration on Aging, 2004; US Census Bureau, 2001). Women will continue to significantly outnumber males because they tend to have longer life expectancies (US Census Bureau, 2002). Statistics have shown that, by 2050, life expectancy at birth will be 92 years for women and 86 years for men; at age 65, life expectancies will be 25 more years for men and 30 more years for women (Administration on Aging, 2004; US Census Bureau, 2003).

With increasing longevity of the female population, the number of elderly persons with chronic illness is also increasing (Wagner et al., 2001). It is currently estimated that 84% of persons aged 65 and older have at least one chronic condition and about 62% have two or more (Anderson & Horvath, 2004). The National Academy on Aging Society (1999) has reported that arthritis, hypertension and heart disease are among the top five chronic conditions faced by women aged 75 and older. In a recent study of elders in retirement communities (80% were women), the most frequently reported chronic conditions were arthritis (64%), high blood pressure (47%), cardiac problems (36%), circulation problems (31%) and urinary tract disorders (26%) (Zauszniewski, Morris, Preechawong, & Chang, 2004b).

Studies have suggested that functional impairments, poor health, being female and perceived lack of social support have been associated with higher rates of depression (Cummings, 2002). In fact, the risk for depression in the elderly increases with co-occurring illnesses, especially when ability to function independently is compromised (St John, Blandford, & Strain, 2006). However, the relationship between depression and medical comorbidity is complex and circular (Raue et al., 2001). That is to say, persons with depression are more vulnerable to physical illness, but at the same time, persons with physical ailments are more prone to depression, which may delay their recovery from physical conditions.

Approximately 25% of elders with chronic illnesses have clinically significant depression (US Department of Health & Human Services, 1999).

A recent study by Adams, Saunders and Auth (2004) with a sample of older adults aged 60–98 (74% women) found that depression was associated with increasing age and with a greater number of chronic health conditions (Adams et al., 2004). Similarly, Bell et al. (2005) found that depressive symptoms correlated most strongly with being female and unmarried, and having fewer financial resources and more chronic conditions (Bell et al., 2005). Depression adversely affects quality of life and may adversely affect the health of the elderly, and in particular, elderly women. Therefore, it is important to assess depressive symptoms in this group. However, assessment of late-life depression is complicated by the absence of measures that capture the range of depressive emotions commonly expressed by elders. Further, the symptoms of many chronic conditions are strikingly similar to the symptoms of depression or they overlap with depressive symptoms.

It is costly to conduct extensive clinical assessments and therefore structured instruments, such as the Center for Epidemiological Studies Depression Scale (CES-D), have been recommended (Raue et al., 2001). However, the 20-item CES-D is still burdensome and studies have reported an abundance of missing data when it is used with elders (Bono, Ried, Kimberlin, & Vogel, 2007; Smits, Cuijpers, Beekman, & Smit, 2007). A number of abbreviated forms of the CES-D have been developed, but they have not been psychometrically tested in elderly women with chronic physical conditions.

Therefore, this cross-sectional, descriptive study of 250 elderly women examined the reliability and validity of the original 20-item CES-D (Radloff, 1977) and 12 CES-D short forms that varied in length from four to 16 items (Andresen, Malmgren, Carter, & Patrick, 1994; Bohannon, Maljanian, & Goethe, 2003; Cole, Rabin, Smith, & Kaufman, 2004; Kohout, Berkman, Evans, & Cornoni-Huntley, 1993; Lawton, Moss, Winter, & Hoffman, 2002; Lewisohn, Seeley, Roberts, & Allen, 1997; Melchior, Huba, Brown, & Reback, 1993; Santor & Coyne, 1997; Shrout & Yager, 1989; Turvey, Wallace, & Herzog, 1999). The study also looked at whether elderly women with chronic conditions would be similarly classified as depressed or not depressed based on standardized cut scores for the 12 abbreviated measures.

Method

Design and sample

A descriptive, cross-sectional design was used to examine depressive symptoms in 250 older women with chronic conditions. The study was a secondary analysis of data from a larger study of elders who were recruited from 29 northeast Ohio retirement communities. The findings from the larger study are reported elsewhere (Zauszniewski, Bekhet, Lai, McDonald, & Musil, 2007; Zauszniewski, Eggenschwiler, Preechawong, Roberts, & Morris, 2006; Zauszniewski et al., 2004a, b).

Instruments

Demographic information was collected to describe the study sample. Age was recorded as participants' reported age in years and birth date. Race was recorded based on participant's self report. The number and types of chronic conditions were measured using a 26-item checklist

developed by Fillenbaum (1988) as the measure of the physical health component of the Older Adults Resources and Services (OARS) Multidimensional Functional Assessment Questionnaire (MFAQ).

Depressive symptoms were measured by the CES-D and the short forms of the CES-D. Participants completed the 20-item CES-D (Radloff, 1977), which asks respondents to rate the frequency with which they experienced each listed symptom during the week prior to the interview on a four-point Likert-type scale ranging from 'rarely' or 'none of the time' (0), to 'most' or 'all of the time' (3). Scores range from 0 to 60; after reverse coding for four items, higher scores indicate greater frequency of depressive symptoms. Alpha coefficients of 0.86 for frail elderly (Davidson, Feldman, Crawford, 1994) and 0.82 for healthy older adults have been reported (Zauszniewski et al., 2004).

We examined 12 short forms of the CES-D scale, with four to 16 items taken from the original 20-item measure. Table 1 lists the items that appear on each of these scales, while the 12 scales all contain items from the original scale (Andresen et al., 1994; Bohannon et al., 2003; Cole et al., 2004; Kohout et al., 1993; Lawton et al., 2002; Lewisohn et al., 1997; Melchior et al., 1993; Santor & Coyne, 1997; Shrout & Yager, 1989; Turvey et al., 1999), they eliminate items that appear redundant or have been found to detract from the internal consistency of the measure.

Table 1. Items appearing on the 20-item CES-D scale and 12 abbreviated CES-D scales.

Item	Scale												
	20-item Radloff	16-item Lawton	11-item Kohout	10-item Andresen	10-item Kohout	10-item Cole	Nine-item Santor	Eight-item Melchoir	Eight-item Turvey	Five-item Bohannon	Five-item Lewisohn	Five-item Shrout	Four-item Melchoir
Bothered	X	X		X		X	X						
Appetite	X	X	X										
Blues	X	X				X	X	X			X		
Felt good	X					X							
Mind	X	X		X		X	X						
Depressed	X	X	X	X	X		X	X	X	X	X	X	X
Effort	X	X	X	X	X	X	X		X				
Hopeful	X			X		X					X	X	
Failure	X	X				X		X					
Fearful	X	X		X		X		X			X		
Sleep	X	X	X	X	X		X	X	X	X	X		
Happy	X		X	X	X		X		X			X	
Talk	X	X							X				
Lonely	X	X	X	X	X	X		X		X			X
Unfriendly	X	X	X		X	X							
Enjoyed	X		X		X		X		X				
Crying	X	X						X		X		X	X
Sad	X	X	X		X		X	X	X				X
Disliked	X	X	X		X							X	
Get going	X	X	X	X	X				X	X			

Some researchers have found the shortened scales to be particularly useful with older adults, and reported acceptable reliabilities, ranging from 0.76 to 0.96. (Andresen et al., 1994; Bohannon et al., 2003; Cole et al., 2004; Kohout et al., 1993; Lawton et al., 2002; Lewisohn et al., 1997; Melchior et al., 1993; Santor & Coyne, 1997; Shrout & Yager, 1989; Turvey et al., 1999). Moreover, all of the shortened scales have been reported to be valid and have correlated significantly with other theoretically related measures (Andresen et al., 1994; Bohannon et al., 2003; Cole et al., 2004; Kohout et al., 1993; Lawton et al., 2002; Lewisohn et al., 1997; Melchior et al., 1993; Santor & Coyne, 1997; Shrout & Yager, 1989; Turvey et al., 1999). In the study reported here, we examined the validity and the reliability of the 12 scales using a four-point Likert-type scale with responses that ranged from 'rarely' or 'none of the time' (0), to 'most' or 'all of the time' (3).

Data collection procedures

Approval from the Institutional Review Board was obtained prior to data collection in the larger study from which these data were obtained. After signing an informed consent form, the older adults were interviewed by trained data collectors, in a private setting at a time convenient for the elders. During the interview, demographic data were obtained on age, race and number and types of chronic conditions and participants completed the 20-item CES-D (Radloff, 1997).

Data analysis

Descriptive statistics were used to describe the study sample. Reliability estimates were used to identify internal consistency estimates for the various abbreviated versions of the CES-D as well as for the full version. The validity of the various short forms and the full CES-D was also evaluated. Pearson's correlations were used to examine relationships between the different CES-D short forms and the 20-item CES-D (Radloff, 1977). Exploratory and confirmatory factor analyses were done to examine patterns of factor loading and the amount of variance explained by these factors using principal axis factoring with varimax rotation. Of particular interest was how the short forms of the CES-D would classify the women as depressed or not depressed using standardized cut scores in comparison with the 20-item CES-D.

Results

The majority of the 250 older women who participated in the study were Caucasian ($n = 231$); 18 were African American, and one was American Indian. Their ages ranged from 64 to 98 years, with a mean of 82.9 years. There were 34 in the young old age cohort (ages 64–74), 105 in the middle-old cohort (ages 75–84) and 111 in the old-old cohort (ages 85 and over). On average, they reported three chronic conditions; the most common were arthritis (66.8%), high blood pressure (47.6%) and heart trouble (36%); 38% ($n = 95$) reported fewer than three conditions, 39% ($n = 97$) reported three or four conditions and 23% ($n = 58$) reported five or more chronic conditions. The total sample's mean score on the 20-item CES-D ($M = 7.24$; standard deviation, $SD = 6.93$) indicated that these elderly women had few depressive symptoms. Their mean scores on the various short versions of the CES-D ranged from 1.37 to 5.42, with standard deviations ranging from 1.78 to 5.59; these scores also indicated few depressive symptoms in these elderly women (Table 2).

Table 2. Scale statistics, standardized cut scores, and estimates of reliability and validity for CES-D scales.

	20- item Radloff	16- item Lawton	11- item Kohout	10-item Andresen	10- item Kohout	10- item Cole	Nine- item Santor	Eight- item Melchior	Eight- item Turvey	Five-item Bohannon	Five-item Lewisohn	Five- item Shrout	Four- item Melchior
<i>Scale statistics</i>													
Mean	7.24	5.42	4.43	4.66	4.98	3.54	3.48	2.63	3.44	2.18	2.27	1.76	1.37
SD	6.93	5.59	4.33	4.36	3.99	3.76	3.85	3.03	3.49	2.40	2.33	1.96	1.78
<i>Standardized cut scores</i>													
Number of items	16	13	9	8	8	8	7	6	6	4	4	4	3
<i>Reliability estimates</i>													
Alpha	0.84	0.83	0.76	0.75	0.75	0.73	0.77	0.75	0.70	0.62	0.59	0.53	0.66
Mean Inter-item r	0.21	0.23	0.22	0.23	0.23	0.21	0.28	0.28	0.23	0.24	0.22	0.18	0.33
<i>Validity estimates</i>													
r with CESD	–	0.96	0.95	0.94	0.93	0.94	0.93	0.87	0.92	0.80	0.82	0.82	0.77
EFA factors extracted	5	4	3	3	3	2	2	2	2	1	2	2	1
Percentage variance explained	39.3%	38.9%	39.9%	34.6%	42.8%	28.1%	36.3%	35.2%	34.4%	28.2%	35.3%	31.7%	34.6%
CFA items loading >0.30	19	16	11	9	10	9	9	8	8	4	4	5	4
Percentage variance explained	22.3%	24.4%	23.1%	24.1%	24.3%	23.6%	27.4%	29.7%	23.7%	28.2%	25.4%	19.4%	34.6%

Reliability analyses revealed an internal consistency estimate of 0.84 using Cronbach's alpha for the 20-item CES-D scale and alphas for the abbreviated scales ranging from 0.53 (five-item Shrout scale) to 0.83 (16-item Lawton scale). The average inter-item correlation was 0.21 for the 20-item scale; correlations for the others ranged from 0.18 (five-item Shrout) to 0.33 (four-item Melchior scale) (Table 2). Correlations between the various abbreviated versions and the 20-item CES-D ranged from 0.77 (four-item Melchior scale) to 0.96 (16-item Lawton scale). Exploratory factor analysis (using principal axis factoring with varimax rotation) for the 20-item Radloff scale resulted in the extraction of five factors explaining 39% of the variance. Exploratory factor analysis for the 12 short forms resulted in the extraction of one to four factors explaining 28.1–42.8% of the variance. Confirmatory factor analysis revealed that all items on the CES-D scales loaded on a single factor with acceptable factor loadings of 0.30 or greater (DeVellis, 2003) except for the 20-item Radloff scale (with 19 of 20), 10-item Andresen scale (with nine of 10), 10-item Cole scale (nine of 10), five-item Bohannon scale (four of five), and the five-item Lewisohn scale (four of five) (Table 2).

We developed a standardized ‘cut score’ for each abbreviated form based on the cut score procedure used with the original 20-item CES-D, which is recognized as a ‘gold standard’. Radloff (1997) established the cut score of 16 on the 20-item CES-D from the highest scoring 15% of respondents who completed the scale, which had four response options for each item, scored 0–1–2–3, with a maximum possible score of 60. To maintain a consistent response format, we retained the same four response options for all 12 short CES-D versions. We used Kohout's formula (Kohout et al., 1993) to determine a standardized cut score using a simple arithmetic ‘conversion’ based on the possible total score for each scale.

For example, if the scale had 11 items, the total score was $33/60 = 0.55$ and this yielded a cut-point of $16 \times 0.55 = 8.8$, or approximately 9. In this example, 33 equals the total score on the 11-item scale, which is divided by 60, the total possible score on the 20-item CES-D. The resulting number, 0.55, is then multiplied by 16, which is the established cut score for the 20-item CES-D, yielding the cut score for the 11-item short form of 8.8, which is rounded to 9. Use of the standardized cut score was essential for this analysis since the recommended cut scores on versions that have used dichotomized or trichotomized response options (Kohout et al., 1993; Turvey et al., 1999) would not be appropriate.

As shown in Table 3, using the cut score of 16 for the 20-item CES-D, 8.4% of the women with fewer than three chronic conditions, 10.3% with three or four conditions and 20.7% with more than five conditions would be considered to have clinically significant depressive symptoms. With the exception of the 16-item Lawton scale, all the short CES-D scales classified a greater percentage of the total sample elderly women as depressed. Both the four-item Melchior and the five-item Lewisohn scales identified the greatest percentage of women in the total sample as having clinically relevant depressive symptoms (24%) (Table 3).

Table 3. Percentage classified as depressed using standardized cut scores for the 20-item CESD and 12 abbreviated scales.

CES-D scales	Total sample (<i>n</i> = 250)	Less than three conditions (<i>n</i> = 95)	Three or four conditions (<i>n</i> = 97)	Five or more conditions (<i>n</i> = 58)
Radloff 20 (16 and above)	12.0	8.4	10.3	20.7
Lawton 16 (13 and above)	9.6	5.3	9.3	17.2

Kohout 11 (9 and above)	16.8	11.6	15.5	27.6
Andresen 10 (8 and above)	23.6	15.8	24.7	34.5
Kohout 10 (8 and above)	18.0	15.8	16.5	24.1
Cole 10 (8 and above)	12.8	9.5	12.4	19.0
Santor 9 (7 and above)	22.0	12.6	22.7	36.2
Melchior 8 (6 and above)	14.4	12.6	15.5	15.5
Turvey 8 (6 and above)	23.2	20.0	21.6	31.0
Bohannon 5 (4 and above)	22.8	21.0	21.6	27.6
Lewisohn 5 (4 and above)	24.0	19.0	23.7	32.8
Shrout 5 (4 and above)	17.2	14.7	17.5	20.7
Melchior 4 (3 and above)	24.0	23.2	23.7	25.9

Note: All values are reported as percentages.

In the subsample of women who reported fewer than three chronic conditions, all the short CES-D scales except for the 16-item Lawton scale classified a greater percentage as depressed. The four-item Melchior scale identified the greatest percentage of those with fewer than three conditions as depressed (23.2%). The 10-item Andresen scale identified the greatest percentage of women with three or four conditions as depressed (24.7%); however, the four-item Melchior and five-item Lewisohn scales also identified a high percentage of these women as depressed (23.7%). Eleven of the 12 short scales would classify a greater percentage of elderly women with three or four conditions as more depressed than the original 20-item CES-D scale: the 16-item Lawton scale classified a smaller percentage of these women as more depressed than the original 20-item Radloff scale. The nine-item Santor scale identified the greatest percentage of women with more than five chronic conditions as more depressed (36.2%). Eight of the 12 short CES-D scales classified a greater percentage of these women as more depressed than the original 20-item CES-D. The eight-item Melchior scale categorized the lowest percentage as more depressed (15.5%) while the Lawton 16-item scale and the Cole 10-item scale classified 17.2 and 19.0% as depressed. The five-item Shrout scale was similar to the 20-item Radloff scale in categorizing 20.7% of these women as depressed (12.6 and 13.4%, respectively; Table 3).

Discussion

Although the 20-item CES-D is commonly used to measure depressive symptoms in elderly persons, researchers have described its length as potentially burdensome, especially for frail elders, and have raised concerns about excessive missing data (Bono et al., 2007; Smits et al., 2007). In response, 12 shortened forms of the CES-D containing four to 16 of the 20 items have been developed; however,

this is the first study to examine the psychometric properties of these abbreviated scales in elderly women with chronic conditions.

In this sample, scores on the 12 short forms of the CES-D were highly correlated (0.77–0.96) with those on the 20-item CES-D scale, supporting their construct validity and potential usefulness with chronically ill older women. These findings are consistent with those of Bohannon and colleagues (2003), who found a correlation of 0.91 between scores on their five-item scale with the full 20-item scale in a sample of outpatients with chronic asthma and diabetes. Similarly, Melchior and colleagues (1993) found a correlation of 0.87 between their four-item scale and the full 20-item scale and a correlation of 0.93 between their 8-item scale and the full 20-item CES-D in a sample of women aged 20–39 years. A correlation of 0.97 was found between the nine-item Santor scale and the 20-item full scale with a sample of primary care patients aged 17–80 years (Santor & Coyne, 1997).

In this study, reliability analyses revealed an internal consistency estimate of $\alpha = 0.84$ for the full 20-item CES-D scale and alphas for the abbreviated scales ranging from 0.53 (five-item Shrout scale) to 0.83 (16-item Lawton scale). The low alpha found in the five-item Shrout scale is consistent with that reported in Shrout and Yager's (1989) original study. Shrout and Yager (1989), the developers of the five-item scale, stated that the low internal consistency was expected since in developing the scale, they selected one item from each of the five factors derived through factor analysis rather than selecting items that loaded together; this method of item selection was done to preserve the diverse aspects of the construct being measured.

Some of the alphas detected in this analysis were very different from the alphas reported in the original studies. For instance, the alphas reported for the 10-item Andresen, nine-item Santor, four-item Melchior and five-item Bohannon scales were 0.97, 0.87, 0.81 and 0.76 in the original studies, as compared to 0.75, 0.77, 0.66 and 0.62 for the same scales in our study. One reason may be that the samples in the other studies differed from the sample used in our study. For example, the ages in Bohannon's study ranged from 18 to 78 years with a mean of 47 years (Bohannon et al., 2003), while in our study, ages ranged from 64 to 98 years, with a mean of 83 years. The ages in Melchior's study ranged from 20 to 39 years (Melchior et al., 1993) and in Santor and Coyne's (1997) study, ages ranged from 17 to 80 years of age. In addition to differences in the ages of the populations studied, the participants in the previous studies were not known to have chronic physical illnesses.

When exploratory factor analysis (principal axis factoring, varimax rotation) was done for the 12 short CES-D forms, one to five factors were extracted and the amount of variance explained ranged from 28.1% (10-item Cole scale) to 42.8% (10-item Kohout scale). Other exploratory factor analyses reported for the shortened CES-D forms have produced a range of one to four factors with explained variance ranging from 48 to 66.3%. Again, differences in demographic characteristics along with the chronic illnesses present in the elders in this analysis may have contributed to these discrepant findings. Also, in some of the previous studies, alternative scoring methods were used with the shorter CES-D forms, including a three-point Likert-type scale ranging from 'hardly ever or never' (0), to 'much or most of the time' (2), or a two-point scale: 'None of the time' (0) and 'much of the time' (1) (Kohout et al., 1993), or a 'yes' (1) and 'no' (0) format (Turvey et al., 1999). We did not collapse the response categories, and this allowed us to focus on item content in comparing the scale, particularly in the classification as depressed or not depressed using standardized cut scores.

Using the established cut score of 16 for the 20-item CES-D, 12% of the total sample of women with chronic conditions would be considered to have clinically significant depressive symptoms. Our examination revealed important differences between the various shortened CES-D measures and the 20-item CES-D, including the possibility false positives (i.e. classification as depressed when not depressed) and false negatives (i.e. categorized as not depressed when depressed). This raises questions about the extent to which symptoms of chronic physical conditions, which may reflect changes in sleep, appetite or energy level, might overlap with depressive symptoms that are measured on one short form but not another.

Cheung, Liu, and Yip (2007) compared five short forms of the CES-D (Andresen et al., 1994; Cole et al., 2004; Kohout et al., 1993; Santor & Coyne, 1997; Shrout & Yager, 1989) with the original 20 item CES-D scale (Radloff, 1977) in their ability to predict suicidal attempts and suicidal thoughts. Short forms with as few as nine items (Santor & Coyne, 1997) performed very much like the full version, but a five-item scale (Shrout & Yager, 1989) showed a detectable difference from the full version in predicting suicidal attempts and suicidal thoughts. In the current study, we compared the performance of the 12 short forms of the CES-D with the original 20-item version in relation to numbers of chronic conditions reported by elderly women.

The 16-item Lawton scale was consistent in identifying the lowest percentage of women as depressed irrespective of the number of chronic conditions reported, which eliminates all positively worded items; yet this scale was correlated most highly with the full CES-D scale. As with the 20-item CES-D, the 16-item Lawton scale showed that, as the number of chronic conditions increased, more women were identified with clinically relevant depressive symptoms. In fact, this trend was also evident across all 12 short scales and it is consistent with numerous studies of chronic conditions and late-life depression (Adams et al., 2004; Bell et al., 2005; St John et al., 2006).

Examination of the various abbreviated CES-D scales in elderly women grouped by number of reported chronic conditions (fewer than three, three or four, and five or more) revealed subtle differences in classification of the women as depressed or not depressed using the standardized cut scores. The four-item Melchior scale categorized the greatest percentage of women with fewer than three chronic conditions as depressed. However, in the two groups where women reported three or four and more than five conditions, the 10-item Andresen, nine-item Santor and five-item Lewisohn scales identified the greatest percentages of women as depressed. It is interesting that the only item in common among the four scales (four-item Melchior, five-item Lewisohn, nine-item Santor and 10-item Andresen) relates to feeling depressed; however, with the exception of the four-item Melchior scale, the other three scales also include the item about sleep.

One limitation of the current study is that only the full version of the CES-D was administered and the responses to the 20 items were used to calculate scores for the various short forms. Previous studies indicated that the short version of a quality of life questionnaire administered alone produced comparable results for the same items administered as a part of the full version (Cheung et al., 2004, 2007). Nevertheless, further studies that use the actual short forms of the CES-D are recommended in order to determine whether responding to the totality of the instrument influences responses to individual items. A second limitation of this study is the use of the standardized cut scores to compare the 12 short CES-D forms with the 20-item CES-D. While such standardization facilitates the examination of the measures using the same four-point response scale, the determination of cut

scores may be somewhat arbitrary. Further examination of the sensitivity and specificity of the various CES-D short forms in relation to diagnostic measures of clinical depression is recommended.

However, our findings point to a need for closer examination of item content on measures of depressive symptoms to determine whether the symptoms that are being measured by the scale truly reflect clinically significant depression or whether they are a part of a co-occurring chronic physical illness. Since untreated depression compromises an elder's ability to manage chronic conditions and can lead to increased morbidity and mortality, further testing of abbreviated measures of the CES-D in elderly women with chronic physical conditions is recommended. Given the likelihood of symptom overlap between chronic physical and mental conditions, it is critical to identify the measures that most accurately capture depressive symptoms in order to provide early intervention for elders with chronic conditions. Measures of depression that either over-identify or under-identify elders as experiencing clinically significant depression can lead to inaccurate interpretations of findings, provision of needless intervention, or withholding of treatment that is needed.

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