CHAPTER 6

USING ITEM RESPONSE THEORY TO EXAMINE THE CONTENT VALIDITY OF THE CENTER FOR EPIDEMIOLOGIC STUDIES DEPRESSION SCALE (CES-D) IN GHANA AND BENIN

SUBMITTED

Marike Alferink
Sandor Klis
Rob R. Meijer
Ghislain E. Sopoh
Yves T. Barogui
Kabiru M. Abass
Chantal Agossadou
Tjip S. van der Werf
Ymkje Stienstra
Maya J. Schroeters
Adelita V. Ranchor
ABSTRACT

The Center for Epidemiologic Studies Depression Scale (CES-D) is widely used to screen for depressive symptoms. We describe the psychometric properties of the CES-D among Beninese and Ghanaian adults, using item response theory. Results were compared to a Dutch group. Information was collected by cross-sectional interviews from Benin (n = 130) and Ghana (n = 64), and self-reported questionnaires from 1736 Dutch individuals. In the African group, all items, except for item 7, 8 and 15, were informative in measuring depressive symptoms. Results were largely similar to the Dutch group. An adapted CES-D version is proposed for Ghana and Benin.
INTRODUCTION

Depression affects around 120 million people worldwide and has, of all chronic conditions, the greatest negative effect on overall health [1]. The disease has a lifetime prevalence in the range of 10 to 15% and is associated with severe morbidity and increased mortality [2]. With more than 85% of the world's population living in low- and middle-income countries, a large proportion of the burden of depression lies in these countries [3]. In countries such as Benin or Ghana for example, there is a lack of good quality treatment, and prevalence rates of depression are not available. In Benin, there is no mental health policy, there are only two psychiatric hospitals and two psychiatrists throughout the country, while the number of psychologists and other health workers is also largely insufficient [4]. Given the importance of mental health for general health, an increased emphasis needs to be put on prioritization of mental health, enhancing monitoring of the situation and improving resources in low-income countries [5]. To monitor the situation, the burden of depression needs to be estimated accurately by use of a validated instrument.

The Center for Epidemiologic Studies Depression Scale (CES-D) is a widely used screening instrument for depressive symptoms. It measures the frequency of 20 symptoms during the past week by 16 negatively formulated and four positive items [6]. The total score is used to indicate depressive symptomatology. The CES-D was developed in westernized countries, and psychometric evaluations generally found satisfying validity (content, criterion [6]), reliability (internal consistency [6,7], test-retest [6]), acceptability and responsiveness in the general population and various patient populations [8]. However, there is debate about the number of factors. Some studies were able to replicate the original four factor structure by Radloff et al. (1977) [9,10], while others find a positive and a negative affect subscale [7,11,12], or one substantive factor [13].

A major limitation of research on the CES-D is that it is used in African populations without validation [14-19], a problem which can lead to inaccurate prevalence rates. This problem is not confined to the CES-D; it reflects a general tendency of studies reporting on depressive symptoms in African countries [20]. When the CES-D is used in different cultures, the factor structure is often different [21], which could be due to different conceptualizations, meanings, and symptom expression across groups [22-24]. For example, the only study on depression from
Benin reported that clinical features of depression overlap with western diagnostic criteria, with differences being a lower frequency of suicidal thoughts and guilt feelings, and a higher frequency of somatic complaints and ideas of persecution [22].

Despite the problem that the CES-D is not validated in African countries, there are also no validated scales measuring related constructs. This hampers the examination of the criterion, convergent or divergent validity. A solution is to focus on the content validity of the CES-D solely, i.e., the extent to which a scale covers all important concepts of the latent trait that the instrument intends to measure. A recommended method for this is item response theory (IRT) [11,13,25], in addition to Classical Test Theory (CTT) methods such the factor structure, reliability (Cronbach’s alpha) and validity. IRT is a useful addition because CTT tend to produce inconsistent findings regarding the CES-D’s factor structure, and because with IRT, we can see in more detail whether all items contribute to the measurement of depression, and whether the instrument accurately assesses depressive symptomatology at various points on the severity continuum.

Previous IRT studies on the CES-D assessed unidimensionality of the latent trait, item fit, scale difficulty and bandwidth of the scale. Results suggest that the positively formulated items are problematic and violate unidimensionality [26], and that the scale seemed most appropriate for non-clinical samples and epidemiological studies [27]. Item fit depended on the study population, e.g., among patients with stroke, the somatic items were less informative [26]. Thus far, there have been no studies using IRT analyses to examine the psychometric properties of the CES-D in African populations.

This study was therefore an important first step in examining the content validity of the CES-D on an item level, by estimating whether the CES-D items were informative in measuring depressive symptoms among healthy adults from Benin and Ghana. The second objective was to validate the results cross-culturally to a large Dutch control group.
METHODS

Ethics statement

The Ministry of Health of Benin approved this study and decided that the study was not subject to the Medical Research Involving Human Subjects act. In Ghana, permission was obtained from the Presbyterian Hospital Agogo. Oral consent was provided by all of the individual participants. Data for the Dutch control group was collected as part of a study on mindfulness, for which informed consent was provided by the Medical Ethical Committee of the University Medical Center Groningen (ABR NL30595.042.09).

Participants and procedure

Sample and sampling

Data for the study group in Benin and Ghana were collected between September and December 2010 in southern Benin (n = 130) and the Ashanti region in Ghana (n = 64) as part of a cross-sectional interview on illness perceptions in Buruli ulcer [28]. 194 healthy community members aged ≥ 18 years, residing in rural areas, were included. Selection of participants was randomly by use of a multi stage sampling procedure [29]. Data for the Dutch control group were collected between April and October 2012 in the Netherlands using a cross-sectional self-reported questionnaire. 7488 people >18 years of age, living in the north and east of the Netherlands were randomly selected and approached via mail. 24.4% returned the questionnaire and finally, 1736 participants were included in the current study.

Procedure

Data for the study group from Benin and Ghana were collected via semi-structured interviews, performed by two native, experienced interviewers, who were trained in administering the interview in the local language; Fon in Benin and Twii in Ghana. Data collection started with asking for permission to the village chief. Thereafter, informed consent was obtained, followed by an introduction, and a set of standard questionnaires. The interview was conducted in a private setting in the village directly after agreement to participate. Data for the Dutch control group was collected by self-reported questionnaire. Study information was sent together with the informed consent and a return envelope. After
receiving the informed consent, the investigator sent the questionnaire with return envelope to the participant.

**Measures**

**Translation and back translation**

In Benin, the English version of the CES-D [6] was translated into French by a Beninese translator whose native language was French (supplemental table 1). Two French and English speaking individuals checked this translation and discrepancies were solved by discussion. The questionnaire was orally translated from French to Fon, and administered in Fon after discussion with the interviewers on appropriate translation. In Ghana, the English version of the CES-D was orally translated into Twii by a native interpreter, and administered in Twii. The Dutch version of the CES-D was used for the Dutch group [30].

**Depressive mood**

The CES-D scale consists of 20 items measuring depressive mood by asking respondents how often they experienced each of the items during the past week. The scale consists of four subscales, respectively ‘somatic-retarded activity’ ‘depressed affect’ ‘interpersonal affect’ and ‘positive affect’. Each item was scored on a four-point scale ranging from (0) ‘rarely or none of the time’ (less than once a week), to (3) ‘most or all of the time’ (5-7 days a week). The responses to the four positively formulated items were subsequently scored in reverse, with higher scores indicating less positive emotions. The total score ranges from 0 to 60, and a score of 16 is used as a cutoff for clinical depression [30]. Previous studies in African populations report Cronbach’s alpha between .84 and .95 [31-35].

**General demographic information**

Information on sex, age, ethnicity, religion, living region, income, occupation, employment status and level of education was assessed by open and closed ended questions.

**Statistical analysis**

SPSS 20 was used for descriptive analyses, and IRT PRO 4.54 and MSPWIN 5.0 [36] for the IRT analyses. Cases with missing values on one or more of the CES-D items
were listwise deleted. In the group from Benin and Ghana, 5.7% \( (n = 11) \) of cases were missing; in the Dutch control group this was 4% \( (n = 70) \).

In this study, a non-parametric model (Mokken model of Monotone Homogeneity), and a 2 Parametric Logistic (2PL) model (Graded Response Model) were used. These models are both suitable for polytomous item responses. The models assume that there is a continuous latent dimension (‘depressive symptoms’, denoted by \( \theta \)), and each respondent has a true location on this dimension, estimated by the responses to the CES-D items. The relationship between the person’s location and the probability of agreement with the item, is estimated by the item step characteristic curve. This curve describes the relationship between the latent trait, and the probability of progressing from a certain answering category to an adjacent answering category. These curves are assumed to be monotonically non-decreasing (non-parametric model) or increasing (parametric model). One of the assumptions of IRT analysis is unidimensionality of the latent variable, which was examined explorative PCA with Varimax Rotation. The number of factors extracted was based on the break in the scree plot.

In a Mokken model for polytomous item scores, the item step characteristic curves are estimated by the items of the test, and there is no assumption about the distribution of the latent trait. The extent to which the data fits to this non-parametric model is called scalability, and reflects how informative each item is in measuring depressive symptoms. Scalability is indicated by the \( H \) value (range 0 to 1), that is low when an item is uninformative and should be excluded. \( H \) values >.30 were considered to reflect sufficiently high scalability. The scalability of the CES-D items were estimated for the Beninese and Ghanaian group, as well as for the Dutch group.

A 2PL model (graded response model) was used only for the Beninese and Ghanaian group to further examine the scalability, item severity and reliability around the cutoff. This model assumes that variety depends on two parameters, namely the item discrimination and item difficulty. The slope parameter \( (a) \) reflects item discrimination, by the strength of the relationship between the item and the latent trait \( (\theta , \text{ range } -3 \text{ to } 3) \). When \( a \) is high (> 1), response categories differentiate well between different levels of the latent trait and the item contains much information. The location parameters \( (b) \) reflect the item difficulty; i.e.,
whether the item measures low, medium or high levels of depressive symptoms. Item- and total information functions from the Graded Response Model were graphically inspected to examine the reliability of measurement at each level of the latent trait. The steeper the information functions, the more reliable the measure is at the latent trait level. These indicators are, together with reliability around the cutoff, part of the validity of the CES-D. Reliability around the cutoff reflects the reliability of the CES-D in measuring depressive symptoms at a certain point on the total score scale.

To investigate the fit of the graded response model, the $S\cdot X^2$ item level diagnostics from the graded response model were examined. For almost all items these diagnostics point at good fit. Furthermore, the marginal fit and the standardized local dependence $X^2$ statistic obtained from IRTPRO were inspected. The manual suggest that values $> 5$ are in a grey area and values $> 10$ point at misfit. Although some values were $> 5$, most $X^2$ statistics were $< 5$ and none of them was $> 10$. So we conclude that the model gave a good description of the data.

RESULTS

Sample characteristics

of the total sample of Beninese and Ghanaian participants, 89 participants were female (45.9%), and the mean age was 37.4 years ($SD = 15.3$). Half of the participants (54.2%; $n = 103$) never attended school, and nearly everyone (99%; $n = 192$) was employed. Sample characteristics were similar for respondents from Benin and Ghana except for sex, $\chi^2 (df=1) = .02$, and religion, $\chi^2 (df=5) = <.001$. Since the effect of sex and religion on the item responses was considered non-influential, the two groups were combined for the IRT analyses. In the Dutch group, 949 participants were female (54.7%), with a mean age of 56 years ($SD = 16.8$). The large majority (94%; $n = 1621$) completed secondary education or more, and nearly half of the participants was employed (48.6%; $n = 842$).

Principal Component Analysis (PCA)

The scree plot from the PCA with Varimax Rotation showed a clear break after 1 factor for both the Beninese and Ghanaian study group and the Dutch control group. The eigenvalue of the first factor was 10.0 in the first and 7.1 in the latter
group, explaining respectively 49.9% and 35.6% of the variance. This suggests that for both groups, the scale reflects a unidimensional latent trait.

**Item Response Analyses**

**Scalability in the Beninese and Ghanaian study groups and the Dutch control group**

In the Beninese and Ghanaian group, an average $H$ of .41 was found and most item $H_i$ values were > .30 indicating that most items showed sufficient scalability (table 1). Item 7, 8 and 15 were rejected because of negative $H_i$ values with one of the other items and/or because the $H_i$ value was below .30. Similar results were found in the Dutch control group for items 8 and 15. The difference between the two groups was that item 7 scored low in the Beninese and Ghanaian group (.23) but not in the control group (.45), while item 4 scored low in the Dutch group (.26) but not in the Beninese and Ghanaian group (.36).

**Item severity in the Beninese and Ghanaian study group**

The Beninese and Ghanaian sample’s $a$ and $b$ parameters from the Graded Response Model for each CES-D item are presented in table 1. All $a$ values were > 1, except for those of items 7, 8 and 15, indicating that these items provided less information. The $b_j$ values for the positively formulated items 4, 8, 12 and 16 were low after reversing the scores (resp. -1.51, -1.13, -1.59, -1.45) compared to the other items, indicating that that respondents were more willing to agree with the positively formulated items. Thus, even when scoring low on the latent trait (depressive symptoms), people were likely to respond in a high answer category for the positive affect items.

**Reliability around the cutoff in the Beninese and Ghanaian group**

The Total Information Curve with its standard error (figure 1) shows that the total scale’s measurement precision, or reliability, is highest in the higher ranges of the latent trait scale. This indicates that the items provide most information for people scoring approximately one standard deviation above the mean of the sample.
DISCUSSION

This was the first study examining the content validity of the CES-D in a sample of community members from villages in Benin and Ghana by using IRT. Comparison to a Dutch control groups showed that in both groups, 17 of the 20 CES-D items were informative in measuring depressive symptoms. Item 8 ‘I felt hopeful about the future’, and 15 ‘people were unfriendly’ were uninformative in both groups. A difference between the two groups was that item 7 ‘I felt that everything I did was an effort’ was uninformative in the Beninese and Ghanaian group but not in the Dutch group. Moreover, the CES-D was most reliable at the higher range of scores of the latent variable and respondents reported more easily a lack of positive affect (measured by the four positively formulated items) than depressive symptoms (measured by the 16 negatively formulated items).

The finding that item 8 was uninformative is consistent with results from Carlson et al. (2011), who found a high percentage of deviant responses for all four reversed items in a sample of ethnically diverse older adults. For item 8, they argued that this is a mixed effect of the positive item formulation and its focus on the future, whereas the other positive items, respectively, ‘I enjoyed life’, ‘I was happy’ and ‘I felt that I was just as good as other people’ refer to the past week [38]. Item 8 could have been uninformative both because of the positive formulation as well as the item content, namely its focus on the future. The item pertains to hope, which could be independent of one’s immediate degree of depression.

A second uninformative item was item 15 ‘people were unfriendly’, which focusses together with item 19, ‘I felt that people disliked me’, on interpersonal concerns. Previous studies also found low item-total correlations between item 15 and the other items [12]. One study removed item 15 because of its statistical and conceptual overlap with item 19 [11] and others suggested that this item is part of other constructs such as social competence [37]. An explanation for our finding (item 15: uninformative, item 19: informative), could be that item 15 does not refer to the self, but to other people’s behavior. In contrast, item 19 asks about a feeling related to oneself.

Item 7 was uninformative in the Beninese and Ghanaian study group, but not in the Dutch control group. Since the respondents in the first group all came from
rural areas with low income, low education and few resources, the answers on this item might have reflected an overall tendency of the way life is being experienced instead of being an indication for depression. Thus, this item might have been uninformative because of the irrelevance of the item content to the specific study group.

Previous studies found that respondents more easily endorsed the positively formulated items (a lack of positive affect) than the negatively formulated items [10,12,38]. This is consistent with our study, showing high mean item scores (after reversing) compared to the negative items. Consequently, the positively formulated items have a relatively great impact on the total depression score.

Furthermore, results showed that three out of the four positive items were informative in measuring depressive symptoms. Since a diminished interest or pleasure in activities is one of the two major symptoms of depression in the DSM-V, we propose - instead of previous suggestions of removing the positive items [12] - to remain a positive affect subscale, but reformulate the items from positive to negative (e.g., ‘I was unhappy’ instead of ‘I was happy’).

Several limitations need to be mentioned. Firstly, the relatively small sample size in the African group, although sample size requirements for IRT are not clear and previous studies used samples of < 200 [39]. Nevertheless, results should be interpreted with cautiousness. Secondly, data were collected by different interviewers by different methods (questionnaire versus interview) however, high correlations between the two administration methods are generally found [40] and similar results were found in our study. Thirdly, the groups from Africa were not comparable to the Dutch group on basic-socio-economic characteristics. We therefore repeated the analysis on the Dutch group with similar age range to the African group (n = 874), and results were not substantially different. Finally, there was no back-translation of the questionnaires from Twii/Fon to English/French. However, thorough discussion among interviewers and researchers ensured accuracy of translation.

This study contributes to the discussion on the cross-cultural validity of screening instruments such as the CES-D, which were developed in western high income countries, and used in Sub-Saharan Africa. Previous studies emphasize the variability in the salience, manifestation and expression of symptoms. By using
advanced statistical methods, our findings are contradictory, namely that there is a high level of agreement in functioning of the instrument between two culturally different groups and therefore, item functioning is less likely to be influenced by cultural differences than previously reported. For future use in Ghana and Benin, a 17-item version of the CES-D, excluding items 7, 8 and 15 is proposed.
Using IRT to examine the CES-D in Ghana and Benin

Table 1. Rest correlations, IRT parameters of the CES-D in the Beninese, Ghana and Dutch group

<table>
<thead>
<tr>
<th>Description</th>
<th>Benin, Ghana</th>
<th>Graded Model Item Parameter Estimates, logit: $a (\theta - b)$</th>
<th>The Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M (SD)$</td>
<td>$R^2$ $H$ $a$ $SE$ $b_1$ $SE$ $b_2$ $SE$ $b_3$ $SE$ $M (SD)$</td>
<td>$R^2$ $H$</td>
</tr>
<tr>
<td>1. Bothered</td>
<td>0.73 (0.85)</td>
<td>.66 .35 1.30 .21 -0.02 0.14 1.41 0.22 3.05 0.48</td>
<td>0.48 (0.65)</td>
</tr>
<tr>
<td>2. Poor appetite</td>
<td>0.74 (0.98)</td>
<td>.73 .40 1.75 .26 0.32 0.12 1.02 0.15 2.14 0.27</td>
<td>0.21 (0.53)</td>
</tr>
<tr>
<td>3. Blues</td>
<td>0.77 (0.91)</td>
<td>.80 .38 1.70 .25 0.05 0.12 1.22 0.16 2.27 0.29</td>
<td>0.18 (0.49)</td>
</tr>
<tr>
<td>4. good as others</td>
<td>1.49 (1.04)</td>
<td>.64 .36 1.26 .19 -1.51 0.25 0.20 0.14 1.27 0.21</td>
<td>0.78 (1.06)</td>
</tr>
<tr>
<td>5. Concentrating</td>
<td>0.79 (0.89)</td>
<td>.70 .37 1.70 .25 -0.03 0.12 1.19 0.16 2.39 0.31</td>
<td>0.64 (0.77)</td>
</tr>
<tr>
<td>6. Felt depressed</td>
<td>0.77 (0.96)</td>
<td>.87 .51 2.92 .41 0.15 0.10 0.85 0.11 1.77 0.18</td>
<td>0.35 (0.64)</td>
</tr>
<tr>
<td>7. Effort</td>
<td>0.92 (0.92)</td>
<td>.57 .23b 1.25 .23 0.82 0.17 1.81 0.29 2.89 0.49</td>
<td>0.62 (0.81)</td>
</tr>
<tr>
<td>8. Hopeful future</td>
<td>1.00 (0.92)</td>
<td>.35 .22b 2.23 .34 0.48 0.11 1.40 0.16 2.43 0.31</td>
<td>0.91 (1.02)</td>
</tr>
<tr>
<td>9. Life a failure</td>
<td>0.50 (0.85)</td>
<td>.48 .33 2.31 .33 0.26 0.10 0.85 0.12 1.40 0.16</td>
<td>0.16 (0.48)</td>
</tr>
<tr>
<td>10. Felt tearful</td>
<td>0.53 (0.80)</td>
<td>.70 .44 1.26 .19 -1.59 0.26 0.07 0.14 1.12 0.19</td>
<td>0.21 (0.51)</td>
</tr>
<tr>
<td>11. Sleep restless</td>
<td>0.85 (1.11)</td>
<td>.82 .48 2.04 .29 0.17 0.11 0.88 0.13 1.97 0.23</td>
<td>0.76 (0.87)</td>
</tr>
<tr>
<td>12. Happy</td>
<td>1.56 (1.05)</td>
<td>.66 .40 1.89 .27 0.20 0.11 1.23 0.16 2.44 0.31</td>
<td>0.77 (0.90)</td>
</tr>
<tr>
<td>13. Talked less</td>
<td>0.81 (0.99)</td>
<td>.81 .45 1.29 .20 -1.45 0.24 -0.08 0.14 0.60 0.15</td>
<td>0.52 (0.73)</td>
</tr>
<tr>
<td>14. Lonely</td>
<td>0.70 (0.87)</td>
<td>.74 .42 2.23 .35 0.64 0.11 1.28 0.15 1.92 0.22</td>
<td>0.40 (0.75)</td>
</tr>
<tr>
<td>15. Unfriendly</td>
<td>0.50 (0.80)</td>
<td>.35 .18b 2.71 .39 0.29 0.10 1.06 0.12 1.95 0.21</td>
<td>0.26 (0.54)</td>
</tr>
<tr>
<td>16. Enjoyed life</td>
<td>1.68 (1.15)</td>
<td>.59 .41 1.35 .24 0.74 0.15 1.69 0.26 2.96 0.49</td>
<td>0.72 (0.90)</td>
</tr>
<tr>
<td>17. Crying spells</td>
<td>0.53 (0.90)</td>
<td>.72 .45 1.90 .29 0.34 0.11 1.50 0.18 2.27 0.29</td>
<td>0.18 (0.50)</td>
</tr>
<tr>
<td>18. Felt sad</td>
<td>0.66 (0.90)</td>
<td>.81 .49 0.81 0.17 -0.49 0.22 1.52 0.33 3.71 0.76</td>
<td>0.37 (0.66)</td>
</tr>
<tr>
<td>19. disliked</td>
<td>0.52 (0.83)</td>
<td>.45 .31 0.70 0.16 -1.13 0.33 1.81 0.43 3.49 0.79</td>
<td>0.26 (0.57)</td>
</tr>
<tr>
<td>20. Not get going</td>
<td>0.59 (0.84)</td>
<td>.65 .42 0.70 0.18 1.13 0.33 3.04 0.77 5.27 1.41</td>
<td>0.63 (0.79)</td>
</tr>
</tbody>
</table>

*aItem-total correlation, corrected for test length and self-correlation, b Excluded items based upon H-value
Figure 1. Total information curve with standard error for the CES-D in the Beninese and Ghanaian group
Supplemental table 1. CES-D French version, used in Beninese study group

<table>
<thead>
<tr>
<th>Rarement ou jamais de temps (moins de 1 jour)</th>
<th>une partie ou un peu de temps (1-2 jours)</th>
<th>De temps en temps ou une partie modérée du temps (3-4 jours)</th>
<th>La plupart ou la totalité du temps (5-7 jours)</th>
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<tbody>
<tr>
<td><strong>Au cours de la semaine dernière.....</strong></td>
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<tr>
<td>1. J'ai été gêné par des choses qui habituellement ne me dérangent pas.</td>
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<tr>
<td>2. Je n'avais pas envie de manger; j'avais peu d'appétit.</td>
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<tr>
<td>3. Je sentais que j'avais le cafard et que même avec de l'aide, ne pouvais pas me débarrasser de ce sentiment.</td>
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<tr>
<td>4. Je me sentais aussi bien que n'importe qui d'autres.</td>
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<tr>
<td>5. J'ai eu du mal à me concentrer sur ce que je faisais.</td>
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<tr>
<td>6. Je me sentais déprimer.</td>
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<tr>
<td>7. Je sentais que tout ce que je faisais, me demandait un effort.</td>
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<td>8. Je me sentais plein d'espoir sur l'avenir.</td>
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<tr>
<td>9. Je pensais que ma vie avait été un échec.</td>
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<tr>
<td>11. Mon sommeil était agité.</td>
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<tr>
<td>13. Je parlais moins que d'habitude.</td>
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<tr>
<td>14. Je me sentais seul.</td>
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<tr>
<td>15. Les gens étaient hostiles.</td>
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<tr>
<td>17. J'ai eu des crises de larmes</td>
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<tr>
<td>18. Je me sentais triste.</td>
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<tr>
<td>19. Je sentais que les gens ne m'aimaient pas.</td>
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<tr>
<td>20. Je ne pouvais rien entreprendre.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter 6

References


8. Smarr KL, Keefer AL. (2011) Measures of depression and depressive symptoms: Beck Depression Inventory-II (BDI-II), Center for Epidemiologic Studies Depression Scale (CES-D), Geriatric Depression Scale (GDS), Hospital Anxiety and Depression Scale (HADS), and Patient Health Questionnaire-9 (PHQ-9). Arthritis Care Res (Hoboken) 63 Suppl 11: S454-66.


