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The Perceived Stress Scale: Factor Structure and Relation to Depression Symptoms in a Psychiatric Sample

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The present study sought to examine the factor structure and psychometric properties of the Perceived Stress Scale (PSS) when administered to psychiatric patients. We also examined predictive validity of the PSS by assessing the association between the Perceived Stress Scale and the Beck Depression Inventory. A heterogeneous sample of 96 psychiatric patients (48 men, 48 women) completed the Perceived Stress Scale (PSS) and the Beck Depression Inventory. Factor analysis of the PSS established that the scale consisted of two factors. The first factor was comprised primarily of items reflecting adaptational symptoms. In contrast, the second factor consisted of items reflecting coping ability. Both factors had an adequate degree of internal consistency. Finally, a series of regression analyses predicting depression found that both factors accounted for unique variance in depression scores in women, but only the first factor accounted for unique variance in men. It is concluded that the PSS is a multidimensional and internally consistent measure of perceived stress.

KEY WORDS: Perceived Stress Scale; distress; coping; depression.

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INTRODUCTION

The importance of life stress has been established in a variety of settings. It has been shown that increased life stress is associated with a host of physical disorders (e.g., Cooper, 1988; Genest, 1989) as well as psychological disorders such as depression and schizophrenia (see Paykel & Dowlatshahi, 1988). Moreover, the need to assess life stress is suggested by findings indicating that life stress often combines multiplicatively with personality measures to predict variance in adjustment scores (see Cohen & Edwards, 1989; Hewitt & Flett, in press).

The recent literature on life stress has witnessed several noteworthy developments. One important development is the recent trend to focus on the subjective appraisal of life stress rather than on objective measures of the impact of life events (e.g., Lazarus, 1984; Kanner, Coyne, Schaefer, & Lazarus, 1981). The focus on subjective appraisal is an important step because this approach recognizes that the impact of a particular stressor will vary across individuals and a key factor is the individual's perception of his or her ability to control the source of stress.

Most popular measures of stress present individuals with a series of either major life events (e.g., Sarason, Johnson, & Siegel, 1978) or specific daily hassles (e.g., Blankstein, Flett, & Koledin, 1991; Delongis, Folkman, & Lazarus, 1988; Kohn, Lafreniere, & Gurevich, 1990) and subjects are asked to provide structured ratings of the impact or frequency of experienced events. There can be little doubt that many important findings have emerged with the use of these measures; however, these findings are limited in certain respects. For instance, one criticism of extant hassles scales involves the item content. These measures require subjects to rate the stress associated with a specific list of daily events. It has been argued elsewhere that certain measures of daily hassles are not suitable for administration to certain populations because they lack appropriate sample-specific content (see Blankstein & Flett, 1992; Blankstein *et al.*, 1991).

The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) appears to represent a viable alternative to these measures. According to the authors, this measure was designed not to measure the frequency or presence of specific stressful events, but to measure "the degree to which individuals appraise situations in their lives as stressful" (Cohen, 1986, p. 716). This measure is not dependent on endorsements of specific events but, rather, on the degree to which individuals experience their lives as unpredictable, uncontrollable, and overloading. The PSS is economical in that it consists of only 14 items. Moreover, because the PSS taps general beliefs about perceived stress and does not provide subjects with a list of experimenter-generated specific life events, scores on the

PSS are not biased by the event content or by the differential recall of past life experiences.

Examination of the literature indicates that the PSS is being used with an increasing degree of regularity in a variety of samples (e.g., Cohen, Sherrod, & Clark, 1986; DeFrank, Ivancevich, & Schweiger, 1988; Gotlib & Whiffen, 1989; Gotlib, Whiffen, Wallace, & Mount, 1991; Hills & Norvell, 1991; Kohn, Lafreniere, & Gurevich, 1991; Kuiper, Olinger, & Lyons, 1986; O'Leary, Shoor, Lorig, & Holman, 1988). In contrast to past observations, this measure shows a relationship to both psychological and physical symptoms that is not due solely to item overlap (see Cohen, 1986). Thus, this measure seems to hold some promise as a measure of perceived stress.

Although Cohen *et al.* (1983) presented information on scale development, reliability, and validity in nonclinical samples, the existing information is limited in that this scale has not been evaluated psychometrically in a psychiatric sample. This lack of information is surprising in that the PSS, with its brief length, would seem to be particularly appropriate in psychiatric settings. In addition, the fact that the PSS does not refer to specific events is important with respect to patients because it does not introduce biases that stem from the differential experience of events or from the impact of chronic versus episodic stressors. Given these observations, the primary purpose of this study was to assess the psychometric properties and factorial structure of the PSS in a heterogeneous psychiatric sample. A mixed clinical sample was chosen so as to ensure that the measures did not have a restricted range which can affect magnitude and direction of relationships among items (see Kline, 1987).

The second purpose of the current research was to assess the relationship of the PSS to a measure of depressive symptomatology in a severely distressed population so as to provide some additional support for the predictive validity of the PSS. There have been many studies suggesting that elevated stress is related to increases in indices of maladjustment such as depression symptoms (e.g., Billings, Cronkite, & Moos, 1983; Hammen, Davila, Brown, Ellicott, & Gitlin, 1992). Although some work has been done using the PSS and depression measures with college students and community samples (Cohen *et al.*, 1983; Cohen, 1986), the relation between the PSS and depressive symptomatology has not been assessed in a general psychiatric sample. This is important because it is well-known that these patients experience elevated depression symptomatology and increased stress levels (see Hewitt & Flett, in press).

Finally, there has been some suggestion that reported stress levels and relationships between stress and adjustment vary as a function of gender in both clinical and nonclinical samples (see Blankstein *et al.*, 1991; Hovanitz & Kozora, 1989). Although Cohen *et al.* (1983) reported no gender

differences in their normal samples, we felt it was appropriate to assess these differences in a clinical sample.

METHOD

Subjects

The subjects were 96 psychiatric patients (48 men, 48 women) from the acute care unit of the Brockville Psychiatric Hospital. The mean age of the sample was 36.20 years (SD = 10.81) and the majority of the subjects were outpatients (76). All patients were interviewed by staff psychiatrists and the most frequent primary diagnoses according to DSM-IIIR criteria (American Psychiatric Association, 1987) were depressive disorders, schizophrenia, marital/family problems, alcoholism, and adjustment disorders.

Materials

Subjects completed the Perceived Stress Scale and the Beck Depression Inventory in a random order.

Perceived Stress Scale. As noted above, the PSS is a 14-item self-report measure of perceived stress. Subjects are asked to rate statements such as "In the past month, how often have you been upset because of something that happened unexpectedly?" and "In the past month how often have you felt that things were going your way?" Subjects rate the items on a 5-point Likert scale with higher scores reflecting greater perceived stress. Seven items are reverse-keyed and items are summed to obtain the final score.

Beck Depression Inventory. The BDI is a 21-item measure of the severity of depressive symptoms (Beck, Rush, Shaw, & Emery, 1979). This measure has been used extensively in research on levels of depression in general clinical samples (e.g., Hewitt & Flett, 1991). Reliability and validity data are summarized by Beck, Steer, and Garbin (1988).

RESULTS

Total PSS Scores

The mean PSS for the sample was 29.07 (SD = 8.81), a value somewhat higher than reported by Cohen *et al.* (1983) for two college student

samples (M = 23.18 and 23.67) and for a community sample (M = 25.0). In addition, the alpha coefficient for the total PSS was .80, which is also consistent with Cohen *et al.* (1983), who reported alphas ranging between .84 and .86. Total PSS scores were correlated significantly with BDI scores [$r(94) = .57, p < .001$]. Finally, an ANOVA was conducted using total PSS scores as the dependent variable and gender as the independent variable. This analysis was significant [$F(1, 94) = 9.58, p < .01$] and indicated that women had higher PSS total scores than men (M = 31.88 and 26.51, respectively). These findings suggest that perceived stress, as assessed by the PSS, tends to be higher in a clinical sample than other samples, and demonstrates that the PSS has adequate internal consistency in this sample. Moreover, the PSS is significantly correlated with severity of depression scores, providing additional support for the predictive validity of the measure and is higher in female psychiatric patients than male psychiatric patients.

PSS Factor Structure Analyses

The 14 items of the PSS were analyzed for the total sample using a principal-components factor analysis with varimax rotation. The eigenvalues are presented in Table I, and although 4 factors had eigenvalues greater than 1.00, a scree plot (Cattell, 1966) suggested that a two-factor solution (which accounted for 46.6% of the variance) was probably most appropriate (Cattell & Jaspars, 1967). The solution was then iterated while holding the number of factors constant (see Comrey, 1988). Factor loadings greater than .40 were considered significant. Seven items loaded on the first factor, and four items loaded on the second factor. These items and their factor loadings are presented in Table II. It can be seen that the first factor involved mainly items that reflected a general distress factor, whereas the second factor involved reverse-keyed items that seem to reflect perceived ability to cope with current stressors.[4]

Unit-weighted sums of the items were used to calculate scores for each factor for all subsequent analyses. The mean of the distress factor was 16.51 (SD = 6.10), whereas the mean for the coping factor was 6.19 (SD = 3.28). Alpha coefficients were calculated for these two factors and were .81 for the distress factor and .72 for the coping factor suggesting that the factors are internally consistent. The correlation between the two factors was small but significant [$r(94) = .26, p < .05$]. Finally, a MANOVA was conducted and indicated a significant overall effect for gender

[4]Item number 10 loaded highly on both factors (.58 on factor 1 and .46 on factor 2) and, thus, was dropped.

Table I. Eigenvalues and Percentages of Variance for the Perceived Stress Scale Items

Factor	Eigenvalue	Percentage of variance
1	4.39	31.4
2	2.12	15.2
3	1.15	8.2
4	1.04	7.4
5	0.92	6.6
6	0.80	5.7
7	0.74	5.3
8	0.63	4.5
9	0.51	3.6
10	0.45	3.2
11	0.40	2.9
12	0.32	2.3
13	0.30	2.1
14	0.23	1.6

[$F(2,93) = 5.58$, $p < .01$]. Univariate ANOVA's showed that women scored higher on the distress factor than men [$F(1,94) = 9.01$, $p < .05$], whereas women and men did not differ on the coping factor [$F(1, 94) = 3.47$, ns].

Finally, in order to address the relationship between the two factors and depression symptoms, two multiple regression analyses were completed whereby the distress and coping scores were entered simultaneously in order to predict BDI scores. Because of the gender difference finding, these analyses were conducted separately for female and male subjects. First, with the female subjects, both the distress factor ($\beta = .35$, $t = 2.67$, $p < .05$), and the coping factor ($\beta = .31$, $t = 2.34$, $p < .05$) accounted for independent variance in depression scores. With the male subjects, the distress factor accounted for significant variance in depression scores ($\beta = .69$, $t = 6.27$, $p < .001$), whereas the coping factor did not ($\beta = .04$, $t = 0.40$, ns).

DISCUSSION

The purpose of the present study was to examine the psychometric characteristics, factor structure, and predictive validity of the PSS in a psychiatric sample. The current results suggest that the PSS tends to be higher in the clinical sample than in other samples (see Cohen *et al.*, 1983; Kuiper

Table II. Items and Factor Loadings for the Perceived Distress and Inability to Cope Factors

Item		Factor 1	Factor 2
Factor 1 (Perceived Distress)			
1.	In the last month, how often have you been upset because of something that happened unexpectedly?	0.74	0.03
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	0.79	0.10
3.	In the last month, how often have you felt nervous and stressed?	0.80	0.14
7.	In the last month, how often have you felt that things were going your way?	0.49	0.38
8.	In the last month, how often have you found that you could not cope with all the things that you had to do?	0.66	–0.02
11.	In the last month, how often have you been angered because of things that happened that were outside of your control?	0.55	–0.24
14.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0.66	0.33
Factor 2 (Perceived Coping)			
4.	In the last month, how often have you dealt successfully with irritating life hassles?	–0.27	0.68
5.	In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	0.16	0.83
6.	In the last month, how often have you felt confident about your ability to handle your personal problems?	0.34	0.65
9.	In the last month, how often have you been able to control irritations in your life?	0.12	0.63

et al., 1986). Moreover, consistent with this other work, the PSS correlated significantly with depression symptomatology in the clinical sample with essentially the same magnitude as reported by Kuiper *et al.* (1986).

Although the total PSS appears to be an appropriate measure for clinical samples with respect to reliability and validity, perhaps the most important findings derive from the results of the factor analysis, which indicated that the PSS consists of two separate and identifiable factors. The first factor resembles the general distress component that past researchers have suggested is a potential confound in the PSS (e.g., Lazarus, Delongis, Folkman, & Gruen, 1985). Although this factor included items that tapped general feelings of lack of control, it also included items that referred directly to negative affective reactions such as anger, upset, and nervousness. In contrast, the second factor consists of items that reflect a perception of an ability to cope with extant stressors. Thus, the PSS appears to be comprised of two separate and reliable components relating to perceived distress. This suggests that the PSS measures not only the presence of negative responses to stressors, but also a perception of the degree of coping ability in relation to existing stressors. Thus, perceiving oneself as distressed may involve both a negative affective experience or reaction and a perception of one's ability to deal effectively with events or changes.

The results also indicate a significant gender difference in perceived stress levels, both for the total scale and for the distress factor. In our clinical sample, women recorded significantly higher stress levels than men on the total PSS and on the general distress factor. These findings are contrary to the earlier findings of Cohen *et al.* (1983), who found no gender differences, but are more consistent with other work (Newmann, 1986). This result may be accounted for by the clinical nature of the present sample, or it could also be that the types of DSM III-R diagnoses represented here (i.e., depressive disorders and schizophrenia) affect the sexes differently. It remains for future research to use a wider clinical sample in order to further examine the nature of gender differences.

The importance of considering both PSS factors separately by gender was demonstrated by the results of the regression analysis predicting depression scores. For both men and women, the distress factor accounted for significant unique variance in depression, which would be expected if this factor was indeed measuring negative affective responses. It suggests that for both men and women, the general distress factor may involve depression symptomatology, which is consistent with several reports (e.g., Gotlib, 1984; Watson & Clark, 1984).

The coping factor, on the other hand, accounted for significant unique variance in depression only in women and not in men. Although this may indicate that the coping factor does not have the same degree of predictive

validity in men that it does in women, there may be other reasons for this finding. For example, several studies have shown gender differences in terms of coping with stress (e.g., Endler & Parker, 1990; Hovanitz & Kozora, 1989), although there were no gender differences in this sample with respect mean levels of the coping factor. The present findings suggest that although female patients may respond with depression symptoms to their perceptions of a lack of coping ability, male patients do not respond with depression symptoms. This is consistent with work showing that men and women differ in terms of their use of coping styles and in the efficacy of these styles in dealing with stress (Billings & Moos, 1984; Endler & Parker, 1990; Hewitt, Flett, & Endler, 1992). This does not mean, however, that men may not respond to perceptions of an inability to cope with other symptom patterns.

The overall findings of this study are important in other respects. At the practical level, the current findings suggest the treatment of stress and depression should focus directly on both the subjective feelings of distress and the lack of perceived ability to control stressful situations. At the theoretical level, the finding that both factors predict variance in depression, at least for women, is important because it pertains to the entire issue of whether content tapping affective responses (symptomatology) should be included in scales such as the PSS. It is especially noteworthy that the coping factor contributed unique variance when predicting depression scores in women. One interpretation of this finding is that the PSS is more than just an alternative measure of psychological maladjustment.

Several issues related to future research with the PSS remain. First, the sample size for the factor analysis completed in this study was somewhat small. Future research with a larger sample of psychiatric patients should be used to determine if a similar factor structure emerges. Moreover, a larger clinical sample could compare factor structures for men versus women and also compare different groups of patients with particular diagnoses. Finally, predicting depression symptoms over time would enhance the findings from this cross-sectional study.

In summary, using a general psychiatric sample, we found evidence that the PSS has two underlying factors reflecting general distress and inability to cope. The overall scale and the two factors are internally consistent and correlate significantly with depression scores. Moreover, both the general distress and the coping factors predicted unique variance in depression scores. In all, the PSS appears to be an appropriate instrument for use with psychiatric samples, and researchers and clinicians would be advised to use the factors as subscales to assess the different components of perceived stress.

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