

Assessing Stress in Cancer Patients

A Second-Order Factor Analysis Model for the Perceived Stress Scale

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Using the Perceived Stress Scale (PSS), perceptions of global stress were assessed in 111 women following breast cancer surgery and at 12 and 24 months later. This is the first study to factor analyze the PSS. The PSS data were factor analyzed each time using exploratory factor analysis with oblique direct quartimin rotation. Goodness-of-fit indices (root mean square error of approximation [RMSEA]), magnitude and pattern of factor loadings, and confidence interval data revealed a two-factor solution of positive versus negative stress items. The findings, replicated across time, also indicate factor stability. Hierarchical factor analyses supported a second-order factor of "perceived stress." This alternative factor model of the PSS is presented along with observations regarding the ~~relevance~~ in cancer research.

Keywords: perceived stress; factor analysis, breast cancer
1983; Sarason, Johnson, & Siegel, 1978; Vinokur & Selzer, 1975). Within this context, the Perceived Stress Scale (PSS; Cohen et al., 1983) has emerged as a popular

During the past 2 decades, the construct of "stress" has received significant investigative attention as a correlate or predictor of psychological and health outcomes (see Cohen, Kessler, & Gordon, 1995; Dougesti&5.-uscu .1,-ceptions or appraisals (Cohen, Kamarck, & Mermelstein,

Indexes during the past 6 years. It is particularly common in psychoneuroimmunology/psychoneuroendocrinology studies among both healthy and some medical popula

Procedure

Informed consent was obtained prior to the initial assessment. Reassessments occurred 12 and 24 months later. All assessments were conducted in person by research assistants/nurses at the university's General Clinical Research Center or breast cancer clinic. Data included psychological, behavioral, and medical/treatment information from interviews, questionnaires, medical records, and when necessary, physician consultation. Women were paid \$25.00 per assessment.

Measure

The PSS (10-item version; Cohen et al., 1983) is a standardized self-report questionnaire of globally perceived stress. The psychometric characteristics (internal reliability, "factor structure") of the 10-item version are regarded by the authors as stronger in comparison to those of a 14-item version (Cohen & Williamson, 1988). Six of the items are negative (e.g., "How often have you felt nervous or stressed?"), and the remaining 4 are positive (e.g., "How often have you felt that things were going your way?"). Each item is rated for the past month on a 5-point Likert-type scale (1 = never to 5 = very often). In scoring the measure, the 4 positive items are reversed scored, and then all the items are summed (range from 0 to 40). A higher total score indicates greater stress. The measure has demonstrated adequate validity (Cohen et al., 1983). The 10 items are invariant with respect to race, sex, and education (Cole, 1999). Reliability coefficients, usis1999Cabatar3

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TABLE 1
Items, Factor Loadings, and Confidence Intervals for the Two-Factor Solution of the Perceived Stress Scale (PSS),
Replicated Across Three Assessments

PSS Items	Factor 1 ^a			Factor 2		
	Initial	12-Month	24-Month	Initial	12-Month	24-Month
A. . . . angered because of things that happened that were outside of your control?	.90 (.83, .99)	.44 (.20, .68)	.65 (.46, .84)	.15 (.10, .20)	-.31 (-.55, .06)	-.12 (-.33, .02)
B. . . . unable to control the important things in your life?	.64 (.45, .82)	.32 (.09, .55)	.69 (.52, .87)	-.13 (-.34, .08)	-.47 (-.69, .24)	-.17 (-.37, .03)
C. . . . nervous or "stressed"?	.60 (.41, .78)	.65 (.42, .86)	.64 (.44, .82)	-.20 (-.40, .01)	-.18 (-.42, .06)	-.19 (-.39, .02)
D. . . . difficulties piling up so high that you could not overcome them?	.57 (.38, .75)	.76 (.55, .98)	.70 (.53, .87)	-.25 (-.46, .05)	-.08 (-.31, .16)	-.18 (-.37, .02)
E. . . . that you could not cope with all the things that you had to do?	.56 (.36, .75)	.82 (.71, .94)	.97 (.91, 1.03)	-.12 (-.34, .09)	.13 (.05, .20)	.16 (.13, .19)
F. . . . upset because of something that happened unexpectedly?	.45 (.25, .65)	.17 (-.08, .42)	.38 (.15, .61)	.31 (-.52, -.10)	-.43 (-.67, -.20)	-.23 (-.47, .00)
G. . . . confident about your ability to handle your personal problems?	-.08 (-.23, .07)	-.03 (-.19, .13)	.01 (-.09, .12)	.79 (.65, .93)	.83 (.68, .98)	.89 (.78, 1.00)
H. . . . that things were going your way?	-.08 (-.24, .09)	-.02 (-.20, .17)	-.02 (-.17, .13)	.72 (.57, .88)	.73 (.56, .91)	.79 (.64, .94)
I. . . . able to control irritations in your life?	.14 (.02, .27)	.05 (-.12, .21)	-.05 (-.26, .16)	.69 (.55, .84)	.75 (.59, .92)	.60 (.39, .80)
J. . . . that you were on top of things?	-.07 (-.27, .12)	.03 (-.16, .23)	-.09 (-.26, .08)	.57 (.38, .75)	.70 (.51, .88)	.73 (.57, .89)

a. All items begin with the stem, "How often have you been/felt . . ."

b. Factor loadings are in bold. 90% confidence intervals for the factor loadings are provided in parentheses.

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