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Positive affect and negative affect correlate differently with distress and health-related quality of life in patients with cardiac conditions: Validation of the Danish Global Mood Scale

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Abstract

Objective: The Global Mood Scale (GMS), assessing negative affect (NA) and positive affect (PA), is sensitive to tapping treatment-related changes in patients with cardiac conditions. We examined the psychometric properties of the Danish GMS and the influence of NA and PA on distress and health-related quality of life (HRQL). **Method:** A mixed group of patients with cardiac conditions (n=502) completed the GMS, the Hospital Anxiety and Depression Scale, the Type D Scale, and the 36-item Short-Form Health Survey. **Results:** The two-factor model of the Danish GMS was confirmed, and the scale was shown to be valid, internally consistent (Cronbach's α NA/PA=.93/.85), and stable over 3 weeks (Pearson's r NA/PA=.82/.80). Unadjusted multiple linear regression analyses showed NA (β=0.67, P<.001), PA (β=−0.17, P=.001), and the interaction effect NA×PA (β=−0.17, P=.015) to be associated with anxiety and depressive symptoms (NA:β=0.99, P<.001; PA:β=−0.12, P=.004; NA×PA:β=−0.43, P<.001), as well as with physical HRQL (NA:β=−0.37, P<.001; PA:β=0.17, P=.001; NA×PA: β=−0.27, P<.001) and mental HRQL (NA:β=−0.72, P<.001; PA:β=0.27, P=.004; NA×PA:β=0.23, P<.001). When adjusting for demographic and clinical characteristics, only NA (β=0.26, P=.003) was associated with anxiety, whereas NA (β=0.75, P<.001) and NA×PA (β=−0.34, P=.002) were associated with depressive symptoms. For physical HRQL, PA (β=0.21, P=.03) and NA×PA (β=−0.36, P=.005) remained significant, whereas NA (β=−0.38, P<.001) and PA (β=0.21, P=.002) remained significant for mental HRQL. **Conclusion:** The Danish GMS is a psychometrically sound measure of affect in patients with cardiac conditions. Future studies should examine changes in both PA and NA and their impact on health outcomes.

Keywords: Global Mood Scale; Negative affect; Positive affect; Emotional distress; Health-related quality of life

Introduction

In the 17th century, Spinoza [1] proposed that all emotions can be derived from the basic emotions pleasure and pain. Today, a different distinction between emotional states is advocated, namely, positive affect (PA) versus negative affect (NA) [2,3]. NA includes symptoms of anxiety and depression, whereas cheerfulness and joy comprise examples of PA [4]. Contrary to common misconception, PA and NA can co-occur at the same time within an individual [5], indicating that they do not merely exist at opposite ends of a continuum [6].

Despite the relative independence of PA and NA [5], this has not translated into a balanced investigation of their impact on health outcomes, as research has largely focused on NA, thereby neglecting the role of positive emotions [4].

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However, accumulating evidence suggests that PA may be important in enhancing our understanding of health [4,7]. In fact, it may be more valuable to study NA and PA in concert as predictors and modulators of health outcomes, as these mood states may interact [4].

Generally, clinical diagnostic categories and trait-based affective measures have been the favored approach in psychosomatic research, although there is no evidence that this approach is more appropriate than evaluating the impact of continuous *normal* affective states on physical health. In cardiovascular disease (CVD), a substantial body of research that focuses on the impact of normal affect and personality on health outcomes is emerging [8–10]. Additionally, many of the psychological measures traditionally used to evaluate the effect of cardiac rehabilitation are not sufficiently sensitive to detecting changes in psychological states, making them inappropriate for this purpose [11–13]. Thus, there is a need for more sensitive measures of psychological states in order to study the effect of psychosomatic therapies and cardiac rehabilitation appropriately.

Measures of PA and NA may aid in providing important insights into the risk and buffering effects of these affects on health outcomes. The Positive and Negative Affect Scale (PANAS) has been widely used as a measure of NA and PA, although not so much so within cardiac populations [14,15]. Building on research ascertaining a link between positive emotions and health, albeit acknowledging the impact of negative emotions, the Global Mood Scale (GMS) was developed and validated in patients with cardiac conditions [16]. The GMS is based on the two-dimensional model of NA and PA [2,3], and assesses the presence and extent of both NA and PA states in a given population. Whereas the PA measure of the GMS and PANAS may be used interchangeably, their measures of NA are distinct, with the PANAS-NA focusing on anxious apprehension and with the GMS-NA focusing on emotional exhaustion [8]. This focus of the GMS-NA was chosen because negative moods may be denied, while individuals may more readily complain about feelings of malaise/fatigue [16,17]. This notion was supported in a recent study reporting higher mean scores on the GMS-NA than on the PANAS-NA [8].

The GMS-PA has been shown to be especially sensitive to detect changes in emotional distress following cardiac rehabilitation [12,13,18], and treatment-related changes on the GMS-NA have been shown to predict long-term mortality in patients with cardiac conditions [19]. In addition to being used as an outcome measure, the GMS can also be used as a determinant representing affective mood states in line with measures of anxiety and depression [8]. Furthermore, Type D personality (the co-occurrence of high negative affectivity and social inhibition), an emerging risk factor in CVD, has been associated with increased psychological distress, impaired health-related quality of life (HRQL), mortality [10], and low PA [20]. These findings suggest that the GMS-PA may be positively associated with patient-centered health outcomes, including HRQL, and, in turn, that the GMS-NA, like other measures of NA, may be negatively associated with HRQL [21–25].

The aims of the current study were to (a) cross-validate the Danish version of the GMS in a mixed group of patients with cardiac conditions, with emphasis on its validity, reliability, and temporal stability, and (b) examine the association between PA and NA, and symptoms of anxiety, depression, and HRQL, respectively, in a mixed group of patients with cardiac conditions.

Table 1
Baseline characteristics stratified by clinical diagnosis

	Total (n=502)	CHF (n=165)	IHD (n=337)	*P*
Sociodemographic				
Age [mean (S.D.)]	65 (10.2)	65 (11.5)	65 (9.5)	.96
Male [*n* (%)]	309 (78)	122 (75)	268 (80)	.29
Married/cohabiting [*n* (%)]	384 (80)	116 (74)	268 (84)	.014*
Psychological				
Anxiety [mean (S.D.)]	4.47 (3.88)	4.64 (4.20)	4.38 (3.72)	.48
Depression [mean (S.D.)]	3.45 (3.33)	4.16 (3.73)	3.11 (3.07)	.001*
Type D personality [*n* (%)]	77 (15)	26 (16)	51 (15)	.86
SF-36 physical component summary score	44.52 (10.36)	40.62 (10.32)	46.44 (9.85)	<.001*
SF-36 mental component summary score	51.89 (10.27)	50.29(11.44)	52.68(9.56)	.027*
Clinical				
Diabetes [*n* (%)]	76 (15)	30 (18)	46 (14)	.08
Hypertension [*n* (%)]	99 (20)	67 (40)	32 (10)	.004*
Hypercholesterolemia [*n* (%)]	278 (56)	70 (43)	208 (62)	.09
Angina [*n* (%)]	371 (88)	55 (63)	316 (94)	<.001*
LVEF [mean (S.D.)]	47 (17.3)	31 (10.5)	57 (12.7)	<.001*
Smoking [*n* (%)]	122 (25)	42 (26)	80 (24)	.56
Comorbidity [*n* (%)][a]	161 (32)	51 (31)	110 (33)	.68

Not all percentages add up to 100% due to missing data.

[a] Cancer, HIV, COPD, neurological or psychological disorder, and so on.

* $P<.05$.