Psychometric Properties of the Psychosocial Risk Factor Survey

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Abstract

The Psychosocial Risk Factor Survey (PRFS) was developed to measure depression, anxiety, anger, social support and emotional guardedness in patients with coronary and pulmonary heart problems. The purpose of this study was to provide preliminary evidence on the psychometric properties of the PRFS scales and items. The Beck Depression Inventory 2 (BDI-II), the Beck Anxiety Inventory (BAI), the State-Trait Anger Expression Inventory 2 (STAXI-II) and the Life Stressors and Social Resources Inventory-Adult Form (LISRES-A) were administered, along with the PRFS, to a sample of 52 patients and 15 college students. Significant differences between patients and non-patients were found on PRFS Depression and Social Support with patients scoring higher on Depression and non-patients scoring higher on Social Support. A series of psychometric analyses were performed to evaluate the PRFS items and reduce the length of the scales. Sixty-six items were deleted, based on a series of item analysis criteria, without compromising the internal consistency reliabilities or convergent validities of the scales. The results were generally revealing of the content validity of the PRFS scales, but more research on the criterion-related validity of the PRFS scales is needed, using larger patient samples.
Psychometric Properties of the Psychosocial Risk Factor Survey

Coronary heart disease (CHD) is the leading killer of American men and women (Cooper, Jackson, Weinman, & Horne, 2002; Grace, et al., 2002b; Kilbourn, Saab, & Schneiderman, 2000; National Institute of Health [NIH], 2000; Smith & Ruiz, 2002). Each year, more than 450,000 people die from CHD (Kilbourn, et al., 2000; NIH, 2000; Smith & Ruiz, 2002), another 1,000,000 experience a first or recurrent coronary event and more than 12,000,000 Americans suffer from CHD (Kilbourn, et al., 2000; Smith & Ruiz, 2002; US Department of Health and Human Services, 2002). CHD is an illness caused by the blockage of the coronary arteries that supply the heart with oxygenated blood (NIH, 2000; Sarafino, 1998). Deposits of cholesterol and other fat-like substances build up along the inner lining of the blood vessels beginning as early as childhood (Smith & Ruiz, 2002). These deposits, called plaque, limit the flow of blood to the heart by narrowing and hardening the artery wall, a process called atherosclerosis (Sarafino, 1998; Smith & Ruiz, 2002).

If the blood vessels become too clogged and blood flow is either briefly stopped or severely limited, the person may experience angina pectoris, painful cramps in the chest and arm, back or neck (Sarafino, 1998). Angina pectoris often happens during exercise or in times of intense stress. During these times, the heart needs more oxygen, and there is not a large enough supply of oxygenated blood. If the blood flow returns quickly to the heart, little or no permanent damage may occur (Sarafino, 1998). If the blockage continues, there is an increased risk of destroying some of the myocardium. This condition is called myocardial infarction (MI) or “heart attack” (Sarafino, 1998) and
results from myocardial ischemia, an insufficient supply of blood and oxygen to the heart (Smith & Ruiz, 2002).

Risk Factors

Uncontrollable risk factors for CHD or a recurring coronary event include age, gender, race/ethnicity and genetics. Atherosclerosis begins in childhood and slowly the fatty deposits thicken the arterial wall (Smith & Ruiz, 2002). Noticeable arterial thickening can be seen as early as middle childhood (Smith & Ruiz, 2002). Prevalence rates for CHD increase dramatically after the age of 45 years (Sarafino, 1998). This is true for both men and women; but men are more likely than women to develop CHD and more likely to die from it (Sarafino, 1998).

Black men and women have higher death rates from CHD than do white, Native American, Hispanic and Asian American men and women (Sarafino, 1998). Also, Russian men and women have high death rates from CHD, and the French and Japanese have low death rates (Sarafino, 1998). These findings support the role of both lifestyle and ethnic factors in CHD. Also, those with a family history of CHD are more likely to have a coronary event themselves (NIH, 2000).

A black man over age 45 with a family history of CHD can nonetheless influence his own fate because controllable risk factors play a role in CHD. High blood cholesterol, hypertension and smoking are three such modifiable factors with a strong link to CHD (Sarafino, 1998; Smith & Ruiz, 2002). High blood cholesterol and low-density lipoprotein levels lead to increased risk for CHD (Waldstein, Snow, Muldoon, & Katznel, 2001), as does chronic hypertension (Smith & Ruiz, 2002). Cigarette smokers who quit have a 50% reduction in mortality rates from CHD (Smith & Ruiz, 2002).
Other risk factors that increase the likelihood of CHD are obesity, stress, inactivity and diabetes (Sarafino, 1998). Regulating fat intake, quitting smoking, losing weight, lowering cholesterol, low-density lipoprotein and blood pressure level will reduce the risk of CHD (Smith & Ruiz, 2002).

Stress, Type A personality, anger and hostility contribute to hypertension, which leads to increased risk for CHD (Sarafino, 1998). Those who exhibit Type A behavior are often hostile, competitive and impatient (Sarafino, 1998). When these individuals are under stress, their anger levels increase, which in turn increases blood pressure, catecholamine and corticosteroid levels (Sarafino, 1998). Regular high levels of the hormones catecholamine and corticosteroid in the blood can cause destruction of the heart and blood vessels (Sarafino, 1998). The catecholamine, epinephrine, has been found to increase platelet clots in the blood stream. This in turn blocks arteries and may cause MI (Sarafino, 1998).

Treatment

CHD treatment after a major coronary event (angina pectoris, MI, etc) requires medication, lifestyle changes and/or surgery. The intensity of the event dictates the intensity of the medication. “Beta-blockers” are drugs that alleviate some of the workload on the heart (NIH, 2000; Smith & Ruiz, 2002). Nitroglycerine and “calcium-channel blockers” are drugs that relax and dilate the arteries (NIH, 2000; Smith & Ruiz, 2002). Both of these medications relieve the symptoms of angina pectoris (NIH, 2000). For patients with severe coronary artery disease, diuretics such as furosemide (Lasix) are prescribed to decrease the blood volume, and anticoagulants such as warafin (Coumadin) and aspirin are given to reduce blood clotting (NIH, 2000; Smith & Ruiz, 2002).
Medications are also prescribed to improve lipid profiles (lower high cholesterol), such as lovastatin (Mevacor), colestipol, cholestyramine, gem fibrozil and niacin (NIH, 2000). If the heart’s pumping is decreased, digitalis drugs or ACE inhibitors such as catopril (Capoten), may be used (NIH, 2000; Smith & Ruiz, 2002).

After major coronary events, lifestyle changes are necessary to prevent recurrent events. The following changes are the most effective way to stop CHD from progressing (NIH, 2000). Changing from a high fat diet to a low fat diet may reduce high cholesterol, which is a leading cause of atherosclerosis (NIH, 2000). Losing weight will also help prevent a second heart attack because cholesterol and blood pressure may be lowered (NIH, 2000). Exercising has also been shown to lower the death rates from CHD (NIH, 2000).

For patients with severe blockages in their coronary arteries, surgery may be necessary. Percutaneous transluminal angioplasty, or balloon angioplasty, is a procedure where a catheter with a tiny balloon on the tip is inserted into the blocked or narrow coronary artery; the balloon is inflated to stretch out the artery and also to break open any blocked passages (NIH, 2000; Smith & Ruiz, 2002). The balloon may be inflated and deflated several times to loosen up the artery walls and increase blood flow to the heart (NIH, 2000).

Another procedure is a coronary artery bypass graft. In this procedure, a healthy blood vessel is taken from the person’s body and grafted onto the blocked artery (NIH, 2000). This bypasses the blocked artery so the blood flows around the obstruction and can get to the heart (NIH, 2000).
Several surgical procedures are currently in experimental phases. Atherectomy is a procedure in which the surgeon shaves off strips of plaque that is blocking the arteries (NIH, 2000). In laser angioplasty, a laser is used to burn or break down the plaque (NIH, 2000). Another option is the insertion of a stent, or metal coil, that is permanently implanted in a narrow artery to prop it open (NIH, 2000).

_**Psychosocial Risk Factors**_

Lifestyle changes, medication and surgery can help relieve the physical symptoms of CHD and help prevent a second event, but psychological factors also play a role in CHD and recovery (Krantz & McCeney, 2002; Strik, Honig, & Maes, 2001). Specifically, depression, anxiety, anger and social support have been shown to affect CHD (Bennett, Owen, Koutsakis, & Bisson, 2002; Carney, Freedland, Miller, & Jaffe, 2002; Grace, et al., 2002a; Kilbourn, et al., 2000; Krantz & McCeney, 2002; Luutonen, Holm, Salminen, Risla, & Salokangas, 2002; Sarafino, 1998; Smith, 2001; Smith & Ruiz, 2002; Strik, et al., 2001).

_Depression._ Symptoms of depression are commonly found in patients after MI, and major depression has been found in 16-23% of patients hospitalized for MI (Carney, et al., 2002; Grace, et al., 2002a; Grace, et al., 2002b; Krantz & McCeney, 2002; Luutonen, et al., 2002). Besides those with major depression, an additional 20% of patients have minor depression (Carney, et al., 2002). Depression occurring simultaneously with CHD has a major negative impact on CHD, causing morbidity and mortality rates to increase as much as five times in the first 18 months after MI (Strik, et al., 2001). Patients with CHD and major depression are two and a half times more likely
to have a coronary heart event within one year than non-depressed patients (Krantz & McCeney, 2002).

The mechanisms that link CHD and depression are not yet fully known. Evidence suggests a strong tie between depression and hypertension, cigarette smoking and a sedentary lifestyle. It has been found that depressed people have higher hypertension than non-depressed people and this in turn leads to increased risk for CHD (Carney, et al., 2002). Depressed people are more likely to smoke cigarettes than non-depressed people (Carney, et al., 2002; Krantz & McCeney, 2002) and it is harder for them to quit (Carney, et al., 2002). Depressed people are also less likely than their non-depressed counterparts to lead active lifestyles (Carney, et al., 2002; Krantz & McCeney, 2002).

Recovery from major depression associated with CHD and MI is very poor. More than 95% of patients with major depression remained depressed at six months after a coronary heart event and almost seventy percent were depressed one year after the coronary heart event (Grace, et al., 2002a). Women are more likely to show signs of depression after a coronary heart event than are men (Grace, et al., 2002a). Comorbid depression decreases the probability of patients sticking to the recommended lifestyle changes, which in turn increases the likelihood of a future coronary heart event (Grace, et al., 2002a).

Anxiety. Anxiety is one of the most common psychological responses to a coronary heart event (Grace, et al., 2002a). In initially healthy people, the symptoms of anxiety predict coronary heart events (Smith & Ruiz, 2002). In patients with CHD, the symptoms of anxiety predict recurrent coronary heart events and mortality (Grace, et al., 2002a; Smith & Ruiz, 2002). The increased risk of those with anxiety symptomatology
may stem from physiological responses to stress induced by anxiety (Grace, et al., 2002a). Of patients who suffered a MI, two-thirds had higher than normal anxiety levels and 26% had levels equal to those in psychiatric patients (Grace, et al., 2002a). Finally, as with depression, women are more likely to show symptoms of anxiety after a coronary heart event than are men (Grace, et al., 2002a).

**Anger.** Experts believe anger is more likely to cause damage or strain to the heart than is hostility (Ramsay, McDermott, & Bray, 2001). A quantitative review of studies through 1994 found that hostility is associated with CHD, and prospective studies have established that hostility is associated with an increased risk of recurrent coronary heart events (Smith & Ruiz, 2002). Hostile people have stronger physiological responses to stress than do agreeable people (Smith & Ruiz, 2002). It is these physiological responses that may facilitate the development of atherosclerosis and, subsequently, CHD (Smith & Ruiz, 2002). The findings of case-control studies suggest anger can produce MI (Smith & Ruiz, 2002). Anger arousal has triggered myocardial ischemia both in laboratory subjects and in everyday life (Smith & Ruiz, 2002). This suggests that hostility and anger are associated with CHD and coronary heart events (Smith & Ruiz, 2002).

Other factors could explain the link between hostility and CHD. Hostile people have greater exposure to stress at both work and at home (Bishop, et al., 2003). If not handled effectively and channeled properly, the anger could undermine their social support structure, which would otherwise help moderate the effect of the stressors (Smith & Ruiz, 2002). Evidence suggests that hostile people also are more likely to exhibit unhealthy behaviors such as smoking, inactivity and high fat intake (Smith & Ruiz, 2002).
Social Support. Social support includes one’s perceived comfort, caring and help a person receives from other people that can be used to personal benefit (Krantz & McCeney, 2002; Sarafino, 1998). Several studies have identified a relationship between social support and cardiovascular disease. These studies have found that those who were less socially integrated (fewer social contacts) were more likely to have a MI (Krantz & McCeney, 2002). The opposite is also true; patients with strong social support improve faster and live longer than patients with less support (Sarafino, 1998). Those who lived alone after a MI had a higher risk for a recurrent coronary heart event than those who lived with others (Krantz & McCeney, 2002). Similarly, people who were not married and had no close friends were more likely to die in the five years after a MI (Krantz & McCeney, 2002). Six other studies have reported similar findings (see Krantz & McCeney, 2002).

The lack of emotional support has been identified as the mechanism by which social isolation results in increased risk for recurrent coronary heart events and post-MI mortality (Krantz & McCeney, 2002). However, it is still not clear if social support is solely to blame as it is correlated with socioeconomic status, medication use, medical compliance and other factors related to health (Krantz & McCeney, 2002).

Depression, anxiety, anger and lack of social support often accompany each other and are overlapping constructs. Depressed people will often show more signs of anxiety and are prone to social isolation (Kilbourn, et al., 2000). Hostile people are also more prone to social isolation because they are less friendly towards people, less likely to see others as friendly and more likely to become isolated (Kilbourn, et al., 2000). Because these risk factors overlap, scales measuring these factors should be positively correlated.
Psychometric Properties

*Psychosocial Measures*

Most importantly, while several published tests measure the four psychosocial risk factors, but no single published test measures all four and has been normed on a cardiac population. The MMPI-II, the Beck Depression Inventory 2 (BDI-II), the Symptom Checklist 90 Revised (SCL-90-R), the Brief Symptom Inventory, the State-Trait Anxiety Inventory (STAI) and the Symptom Assessment 45 Questionnaire (SA-45) are measures or have subscales that measure depression and/or anxiety (Derogatis & Savitz, 1999; Gregory, 2000; Katz, Katz, & Shaw, 1999; Maruish, 1999; Spielberger, Sydeman, Owen, & Marsh, 1999). These tests vary from the 21-item BDI-II (Katz, Katz, & Shaw, 1999) to the 567-item MMPI-II (Greene & Clopton, 1999; Gregory, 2000). A shorter test is preferred over a longer test as long as the shorter test has adequate validity, as tests that include more items than are needed are unnecessarily time consuming to administer. Tests such as the MMPI-II measure only some of the needed factors as well as many irrelevant ones. Others, like the SCL-90-R, measure different forms of the construct such as phobic anxiety, as opposed to generalized anxiety (Derogatis & Savitz, 1999).

*Cardiac Rehabilitation*

Cardiac rehabilitation consists of “services that are comprehensive, long-term programs involving medical evaluation, prescribed exercise, cardiac risk-factor modification, education and counselling (sic)” (Daly, et al., 2002, p. 8). Cardiac patients have a lot to deal with, even after minor coronary heart events. Cardiac rehabilitation is intended to help patients deal with their CHD, improve their quality of life, promote
recovery and reduce the risk of recurrent coronary events (Daly, et al., 2002; Grace, et al., 2002b; McGee, Hevey, & Horgan, 1999; Sarafino, 1998).

Standard cardiac rehabilitation programs generally begin a week after the coronary heart event when the patient has returned to the general ward (Sarafino, 1998). Cardiac rehabilitation programs give the patient information regarding diet, medications, recommended lifestyle changes and the symptoms usually experienced after coronary heart events (Sarafino, 1998). Exercise regimens are also standard (Sarafino, 1998). The patient is supervised for a certain period of time and is gradually given more independence (Smith & Ruiz, 2002). Stress management is also part of many cardiac rehabilitation programs and psychosocial interventions are becoming ever more prevalent (Sarafino, 1998; Smith & Ruiz, 2002).

Patients most likely to benefit from cardiac rehabilitation programs are those who have had coronary artery bypasses, an angiplasty, MI or angina pectoris (Smith & Ruiz, 2002). Unfortunately, not all patients who can benefit from cardiac rehabilitation are referred by their cardiologists (Smith & Ruiz, 2002). Even if they are, some do not attend right away and some drop out early (Smith & Ruiz, 2002). About 50% of patients in cardiac rehabilitation exercise programs stop attending within the first six months (Daly, et al., 2002; Sarafino, 1998). Patients with depression and/or anxiety have been found to be more likely to leave cardiac rehabilitation programs, which in turn leads to poor health outcomes (Sarafino, 1998). Patients in a cardiac rehabilitation program are more likely to attend if they have their family’s support (Daly, et al., 2002).

Benefits of Cardiac Rehabilitation
The benefits of cardiac rehabilitation programs are evident on general and specific levels. Sarafino (1998) states that many patients who have had a MI and make healthful changes to reduce risk factors and improve attitudes live longer than similar people who have not had a MI. Beyond the general benefit of living longer, “[cardiac rehabilitation] programs have been shown to have beneficial effects on mortality, exercise tolerance, functional capacity, lipid levels, blood pressure, symptoms of angina and dyspnea, weight loss, smoking behavior, stress level and psychosocial functioning” (Grace, et al., 2002b, p. 127).

Exercise shows both physical and psychosocial benefits (Sarafino, 1998). Those in cardiac rehabilitation exercise programs show greater improvement in an array of physiological measures than those who are not in cardiac rehabilitation (Sarafino, 1998). Also, exercise reduces hypertension and depression and increases activity levels (Smith & Ruiz, 2002). Multifactor cardiac rehabilitation programs can reduce mortality by 25% (Grace, et al., 2002b). They also reduce anxiety by providing information and quieting uncertainties (Grace, et al., 2002b).

Present Study

Eichenauer and Feltz (2002) created the PRFS to provide a quick, reliable and valid initial screening device for patients with cardiovascular disease. The PRFS is meant to measure depression, anxiety, anger, social support and emotional guardedness and to assist clinicians and medical staff in diagnosis and rehabilitation referral. The present study involved collecting and analyzing preliminary data on the measurement properties of the Psychosocial Risk Factor Survey (PRFS). This included an evaluation of the PRFS items to refine the item pool. A longer-term goal is to produce a measure
designed specifically for use in cardiac rehabilitation referral. The purpose of this Senior Honors Thesis was to collect and analyze data on the psychometric properties of the PRFS, and to eliminate items that do not contribute to the reliability and validity of the test.

Method

Participants

There were 67 subjects in the study; 52 patients in cardiac rehabilitation programs around the Miami Valley area (29 males, 23 females), and 15 Wittenberg University students enrolled in introductory psychology courses (four males, 11 females). All participants signed informed consent forms and were treated in accordance with the ethical standards of the American Psychological Association.

Measures

*Psychosocial Risk Factor Survey* (PRFS; Eichenauer & Feltz, 2002). The PRFS is a 158-item self-report questionnaire designed specifically for screening patients with cardiovascular problems for depression, anxiety, anger and social support. The PRFS scales are Depression, Anxiety, Anger, Social Support and Emotional Guardedness. Item responses range from one (*strongly agree*) to five (*strongly disagree*). Examples of the depression items are “I don’t feel energetic” and “Everything just seems hard these days.” Two anxiety items are “My stomach feels tied up in knots a lot” and “I often get butterflies in my stomach.” The anger items include “I get angry at the drop of a hat” and “I get frustrated more often than most people.” Two social support items are “I have a best friend” and “I enjoy the company of others.” Two emotional guardedness items are
“I have always learned from my mistakes” and “I have never had any reason to doubt my physician’s advice.”

*Beck Depression Inventory-II* (BDI-II; Beck, Steer, & Brown, 1996). Item responses on the 21-item BDI-II range from absence of the target variable (i.e. sadness), scored as zero, to full intensity of the variable, scored as three. Higher scores indicate greater depression. The BDI-II is reliable and has been validated against its predecessor, the BDI, in the general population and in populations with chronic illnesses including cardiac patients (Beck, Steer, & Brown, 1996; Grace, et al., 2002b; Gregory, 2000).

*Beck Anxiety Inventory* (BAI; Beck & Steer, 1990). The BAI is a 21-item, self-report measure of anxiety. The items ask how much the person has been bothered by symptoms in the past week on a four-point Likert scale from zero (*not at all*) to three (*severely, I could barely stand it*). Higher scores indicate higher anxiety. There is considerable supportive evidence for the reliability and validity of the BAI (Wilson, De Beurs, Palmer, & Chambless, 1999).

*State-Trait Anger Expression Inventory Two* (STAXI-II; Spielberger, 1999). The 57-item STAXI-II measures state anger, trait anger and anger expression. Section one of the STAXI-II ask *how I feel right now* on a four-point Likert scale from one (*not at all*) to four (*very much so*). Section two items ask *how I generally feel* on a four-point Likert scale from one (*almost never*) to four (*almost always*). Section three questions ask *how I generally react or behave when angry or furious* on the same scales as section two. Each item is scored from one to four with higher scores indicating more anger.

*Life Stressors and Social Resources Inventory-Adult Form* (LISRES-A; Moos & Moos, 1994). The LISRES-A is a 200-item self-report questionnaire with eight sections:
physical health, home/neighborhood, finances, work, spouse/partner, children, extended family and friends and social activities. In this study, only items 100-200 were used because these items measured spouse, family, child and friend resources and stressors, which are the best measure of social support in cardiac patients. Most questions use a five-point Likert scale with responses ranging from never to often. Some questions ask yes or no with additional sub-questions. Others use a four-point Likert scale from definitely yes to definitely no. The point scales range from zero to four. There are nine stressor subscales and seven resource subscales. This study used the Spouse, Family, Children and Friend Resources and Spouse, Family, Children and Friend Stressors subscales.

Procedure

The cardiac rehabilitation patients completed the PRFS and a subset of the other four scales. Because of time constraints, some patients were only able to complete the PRFS and from one to four of the other tests. The Wittenberg students were given extra credit for their introductory psychology courses to participate in the study. Each student was given the PRFS, the BDI-II, the BAI, the STAXI-II and the LISRES-A, which they completed in small-group sessions.

Analyses

Descriptive statistics were computed for all scales, and independent samples $t$-tests compared males and females, patients and non-patients, and patients with coronary versus pulmonary problems. Pearson correlations between the PRFS scales and the corresponding published scales assessed their convergent validity. To evaluate the PRFS items, correlations of each item with its “target” scale (i.e. corrected item-total
correlation) were compared to correlations of the items with the four PRFS “non-target” scales. Items with corrected item-total correlations < .40 and correlated more highly with any of the four non-target scales than its own scale, were deleted. Following item deletion, all of the scale analyses were run again.

The “core” scales were the BDI-II (Depression), the BAI (Anxiety), the Trait Anger scale from the STAXI-II (Anger) and the Friend Resources scale from the LISRES-A (Social Support). PRFS Emotional Guardedness was not included in the analyses; its reliability (.14) was inadequate and there was no “target” scale among the other measures.

Results

Descriptive Statistics

Descriptive statistics, $t$-values and internal consistency reliabilities for each scale are displayed in Table 1. Patients scored significantly higher than non-patients on PRFS Depression and the BDI-II. Non-patients scored significantly higher than patients on PRFS Social Support, the LISRES Friend and Family Resources scales and the LISRES Spouse Resource scale.

There were no significant differences between men and women except in Anger Expression. Men ($M = 45.5$) expressed more anger than women ($M = 29.1$; $t = 2.90; p < .01$). A $t$-test for type of cardiac problem (coronary or pulmonary) revealed no significant differences between coronary patients and pulmonary patients on any of the scales.

Correlational Analyses

The four PRFS scales correlated significantly and positively with measures of the “target” scales and, with the exception of Anxiety, these convergent validity coefficients
were higher than others in the matrix (Table 2). Also, PRFS Depression had significant positive correlations with the BAI and STAXI-II Trait Anger, and had a significant negative correlation with Friend Resources. PRFS Anxiety correlated significantly and positively with the BDI-II and Trait Anger scales, and negatively with the LISRES-A Friend Resources. While PRFS Anger correlated significantly with the BDI-II, it did not correlate significantly with the BAI or Friend Resources Scale. Social Support was significantly negatively correlated with both the BDI-II and the BAI, and uncorrelated with Trait Anger. Correlations among the PRFS scales produced a similar pattern (Table 3). Depression, Anxiety, and Anger all correlated positively with each other, and negatively with Social Support.

*Item Analyses*

Eight items from the Depression scale had corrected item-total correlations lower than .40. Seven items correlated higher with at least one other PRFS scale than with its own scale, indicating that the item has more in common with another scale than it does with its “target” scale. Two items failed both criteria for retention. Before deletion, the Depression scale contained 37 items and had a reliability of .94. After deletion, the Depression scale had 24 items and a reliability of .94. See Table 4 for an illustrative item analysis of the PRFS depression scale.

Twelve items from the Anxiety scale had corrected item-total correlations lower than .40, 13 items correlated higher with another PRFS scale than with the target scale, and five items failed both retention criteria. Before deletion, the Anxiety scale contained 39 items and had a reliability of .92. After deletion, the Anxiety scale had 19 items and a reliability of .91.
Fourteen items from the Anger scale had corrected item-total correlations lower than .40, six items correlated higher with another PRFS scale than with the target scale, and six items failed both retention criteria. Before deletion, the Anger scale contained 35 items and had a reliability of .89. After deletion, the Anger scale had 21 items and a reliability of .92.

Finally, 15 items from the Social Support scale had corrected item-total correlations lower than .40, 10 items correlated higher with another PRFS scale than with Social Support, and seven items failed both retention criteria. Before deletion, the Social Support scale contained 35 items and had a reliability of .89. After deletion, the Social Support scale had 16 items and its reliability was unchanged.

The pattern of correlations between the PRFS scales and the corresponding scales remained nearly the same after item deletion (Table 6). And, as expected, correlations among the PRFS scales all decreased slightly after the overlapping items were deleted (Table 7).

Discussion

The results of this study provide a preliminary evidence for the reliability and convergent validity of the PRFS, and modest support for its ability to distinguish patients and non-patients. Correlations of the PRFS scales with the corresponding “target” scales indicate good convergent validity between the PRFS and the other tests. The Depression scale correlated highly with the BDI-II, in support of its construct validity. The lower, but still significant correlation between Depression and the BAI points to an overlap of these psychosocial risk factors. PRFS Depression and LISRES-A Friend Resources were also significantly correlated (negatively) as expected. People with high social support are
less depressed, perhaps because friends and family help them avoid depression or successfully cope with it.

The lower correlation of PRFS Anxiety with the BAI than Depression suggests that PRFS Anxiety does not measure anxiety as much as it does depression. Additional revisions are needed to align the scale more closely with Anxiety than with Depression. Again, LISRES-A Friend Resources scale is negatively correlated with PRFS Anxiety. Social support is associated with reduced anxiety, and with lower levels of depression. Other people are around to calm anxious people and help them cope with small problems that might otherwise appear daunting.

The PRFS Anger scale showed good convergent and discriminant validity. The BAI and LISRES-A Friend Resources scales had relatively small correlations with PRFS Anger.

Social Support was negatively correlated with the other scales, and positively correlated with Friend Resources. The large correlation between Social Support and Friend Resources demonstrates that the Social Support scale assesses the level of friend resources.

The item deletions produced virtually no reduction in reliability. This shows that the item deletion had the desired effect; that is, overlap among the PRFS scales was reduced, although slightly. Convergent validity coefficients for the scales remained almost the same (Table 6), indicating that the deletions did not compromise the psychometric properties of the PRFS scales.
**Limitations**

The small number of subjects precluded some important analyses, including item factor analyses. Each patient completed different subsets of the measures. Only nine subjects responded to enough Spouse Resource and Stress questions to yield a scale score. Only nine patients answered enough Children Resource and Stress questions (scale not included in analyses) to have their score computed; no non-patient did.

**Future Directions**

Future research should be aimed at getting more subjects to take all of the tests so a more complete analysis can be done. With enough subjects, a factor analysis could be run to determine the factor structure of the scales. Also, items with low factor loadings on all scales or equally high loadings on more than one scale could be deleted. More research and analyses need to be done with Emotional Guardedness before its reliability and validity can be determined.
References


Psychometric Properties


Table 1

*Descriptive Statistics and Between-Group Differences for all Scales*

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<td>4.34</td>
<td>16</td>
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<tr>
<td>BDI-II</td>
<td>16.47</td>
<td>13.47</td>
<td>51</td>
<td>8.33</td>
<td>6.14</td>
<td>15</td>
<td>3.30**</td>
<td>0.95</td>
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<td>BAI</td>
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<td>11.32</td>
<td>50</td>
<td>7.80</td>
<td>7.89</td>
<td>15</td>
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<td>STAXI-II</td>
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<td>State Anger</td>
<td>18.63</td>
<td>6.09</td>
<td>19</td>
<td>16.67</td>
<td>3.44</td>
<td>15</td>
<td>1.12</td>
<td>0.92</td>
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<tr>
<td>Trait Anger</td>
<td>17.47</td>
<td>5.21</td>
<td>19</td>
<td>18.80</td>
<td>6.57</td>
<td>15</td>
<td>-0.66</td>
<td>0.89</td>
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<tr>
<td>AX Index</td>
<td>38.06</td>
<td>16.62</td>
<td>18</td>
<td>29.38</td>
<td>14.84</td>
<td>13</td>
<td>1.50</td>
<td>0.85</td>
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<tr>
<td>LISRES-A</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Spouse Resource</td>
<td>11.60</td>
<td>4.51</td>
<td>5</td>
<td>19.75</td>
<td>2.87</td>
<td>4</td>
<td>-3.12*</td>
<td>0.87</td>
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</tr>
<tr>
<td>Spouse Stress</td>
<td>8.80</td>
<td>3.96</td>
<td>5</td>
<td>5.50</td>
<td>3.37</td>
<td>4</td>
<td>1.33</td>
<td>0.67</td>
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</table>

*(Table Continues)*
<table>
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<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>t</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Resource</td>
<td>9.91</td>
<td>3.93</td>
<td>11</td>
<td>17.36</td>
<td>3.77</td>
<td>15</td>
<td>-4.89**</td>
<td>&lt; .01</td>
<td>0.87</td>
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<tr>
<td>Family Stress</td>
<td>7.77</td>
<td>3.16</td>
<td>11</td>
<td>6.67</td>
<td>3.27</td>
<td>15</td>
<td>0.87</td>
<td>0.89</td>
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</tr>
<tr>
<td>Friend Resource</td>
<td>19.64</td>
<td>8.25</td>
<td>11</td>
<td>33.13</td>
<td>4.05</td>
<td>15</td>
<td>-5.00**</td>
<td>&lt; .01</td>
<td>0.91</td>
</tr>
<tr>
<td>Friend Stress</td>
<td>4.91</td>
<td>2.51</td>
<td>11</td>
<td>6.73</td>
<td>2.84</td>
<td>15</td>
<td>-1.70</td>
<td>0.69</td>
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</tr>
</tbody>
</table>

* p < .05.  ** p < .01.

Note. PRFS – Psychosocial Risk Factor Survey; EG – Emotional Guardedness; BDI-II – Beck Depression Inventory-2; BAI – Beck Anxiety Inventory; STAXI-II – State-Trait Anger Expression Inventory-2; AX – Anger Expression; LISRES-A – Life Stressors and Social Resources Inventory-Adult Form.
Table 2

*Correlations of PRFS Scales with the BDI-II, BAI, Trait Anger and Friend Resources*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Depression</th>
<th>Anxiety</th>
<th>Anger</th>
<th>Social Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI-II</td>
<td>0.802**</td>
<td>0.729**</td>
<td>0.459**</td>
<td>-0.703**</td>
</tr>
<tr>
<td>BAI</td>
<td>0.534**</td>
<td>0.557**</td>
<td>0.196</td>
<td>-0.347**</td>
</tr>
<tr>
<td>Trait Anger</td>
<td>0.343*</td>
<td>0.515**</td>
<td>0.733**</td>
<td>-0.083</td>
</tr>
<tr>
<td>Friend Resources</td>
<td>-0.774**</td>
<td>-0.497**</td>
<td>-0.284</td>
<td>0.865**</td>
</tr>
</tbody>
</table>

* p < .05.  ** p < .01.

Note. Boldface correlations are convergent validity coefficients. PRFS – *Psychosocial Risk Factor Survey*; BDI-II – *Beck Depression Inventory 2*; BAI – *Beck Anxiety Inventory*; the Trait Anger scale is a subscale of the STAXI-II; the Friend Resources scale is a subscale of the LISRES-A.
Table 3

*Correlations among the Psychosocial Risk Factor Survey Scales*

<table>
<thead>
<tr>
<th>PRFS Scale</th>
<th>Depression</th>
<th>Anxiety</th>
<th>Anger</th>
<th>Social Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.881</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>0.575</td>
<td>0.649</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Social Support</td>
<td>-0.712</td>
<td>-0.562</td>
<td>-0.386</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note.* All correlations are significant at $p < .01$. PRFS – *Psychosocial Risk Factor Survey.*
Table 4

*Illustrative Item Analysis of the PRFS Depression Scale*

<table>
<thead>
<tr>
<th>Item</th>
<th>Corrected Item-Total Correlation</th>
<th>Anxiety</th>
<th>Anger</th>
<th>Social Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deleted Items</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. My appetite is as good as it has ever been.</td>
<td>.2756</td>
<td>.219</td>
<td>-.027</td>
<td>-.196</td>
</tr>
<tr>
<td>41. I have lost weight recently.</td>
<td>-.0072</td>
<td>.074</td>
<td>-.137</td>
<td>.111</td>
</tr>
<tr>
<td>91. I don’t like winter.</td>
<td>.2862</td>
<td>.320**</td>
<td>.344**</td>
<td>-.323**</td>
</tr>
<tr>
<td>Retained Items</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Everything just seems hard these days.</td>
<td>.7404</td>
<td>.734**</td>
<td>.497**</td>
<td>-.490**</td>
</tr>
<tr>
<td>137. I am an unhappy person.</td>
<td>.7772</td>
<td>.624**</td>
<td>.457**</td>
<td>-.598**</td>
</tr>
<tr>
<td>142. I don’t feel energetic.</td>
<td>.7458</td>
<td>.633**</td>
<td>.253*</td>
<td>-.586**</td>
</tr>
</tbody>
</table>

* p < .05.  ** p < .01.

*Note.* PRFS – *Psychosocial Risk Factor Survey.*
Table 5

Descriptive Statistics and Between-Group Differences for the Revised PRFS Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Patients M</th>
<th>Patients SD</th>
<th>Non-patients M</th>
<th>Non-patients SD</th>
<th>t</th>
<th>∞</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRFS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>65.40</td>
<td>16.69</td>
<td>49.56</td>
<td>15.91</td>
<td>3.36**</td>
<td>.94</td>
</tr>
<tr>
<td>Anxiety</td>
<td>57.25</td>
<td>13.65</td>
<td>49.75</td>
<td>14.76</td>
<td>1.89</td>
<td>.91</td>
</tr>
<tr>
<td>Anger</td>
<td>58.06</td>
<td>14.00</td>
<td>54.75</td>
<td>16.85</td>
<td>0.79</td>
<td>.91</td>
</tr>
<tr>
<td>Social Support</td>
<td>52.00</td>
<td>11.35</td>
<td>65.31</td>
<td>9.41</td>
<td>-4.26**</td>
<td>.89</td>
</tr>
</tbody>
</table>

* p < .05.  ** p < .01.

Note. The descriptive statistics, t, and alpha for the Emotional Guardedness scale were not recomputed because no items were deleted from this scale.
Table 6

Correlations of the Revised PRFS Scales with the BDI-II, BAI, Trait Anger and Friend Resources

<table>
<thead>
<tr>
<th>Scale</th>
<th>Depression</th>
<th>Anxiety</th>
<th>Anger</th>
<th>Social Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI-II</td>
<td>0.795**</td>
<td>0.725**</td>
<td>0.496**</td>
<td>-0.645**</td>
</tr>
<tr>
<td>BAI</td>
<td>0.510**</td>
<td>0.577**</td>
<td>0.234</td>
<td>-0.318**</td>
</tr>
<tr>
<td>Trait Anger</td>
<td>0.267</td>
<td>0.461**</td>
<td>0.761**</td>
<td>0.048</td>
</tr>
<tr>
<td>Friend Resources</td>
<td>-0.797**</td>
<td>-0.474*</td>
<td>-0.303</td>
<td>0.855**</td>
</tr>
</tbody>
</table>

* p < .05. ** p < .01.

Note. Boldface correlations are convergent validity coefficients. PRFS – Psychosocial Risk Factor Survey; BDI-II – Beck Depression Inventory 2; BAI – Beck Anxiety Inventory; the Trait Anger scale is a subscale of the STAXI-II; the Friend Resources scale is a subscale of the LISRES-A.
Table 7

*Correlations among the Revised PRFS Scales*

<table>
<thead>
<tr>
<th>PRFS Scale</th>
<th>Depression</th>
<th>Anxiety</th>
<th>Anger</th>
<th>Soc Sup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.813**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>0.549**</td>
<td>0.604**</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Soc Sup</td>
<td>-0.703**</td>
<td>-0.489**</td>
<td>-0.296*</td>
<td>--</td>
</tr>
</tbody>
</table>

* * p < .05.  ** p < .01.

*Note.* PRFS – Psychosocial Risk Factor Survey.