

Psychometric Properties of a 4-item Depression and Anxiety Risk Screening Tool for Cancer Survivors

Alexandra K. Zaleta, PhD, Melissa F Miller PhD, MPH, Shauna McManus, BS, Mitch Golant, PhD, Joanne S. Buzaglo, PhD

Cancer Support Community, Research and Training Institute, Philadelphia, PA USA

Background

- Screening for depression and anxiety is recommended for cancer survivors, which can have serious negative effects if left untreated
- CancerSupportSource® (CSS) is a cancer-related distress screening and referral program used at community-based cancer organizations and hospitals nationwide

Aims

- The study examined the psychometric performance of two depression (CSS-D) items (feeling sad or depressed; feeling lonely or isolated) and two anxiety (CSS-A) items (feeling nervous or afraid; worrying about the future and what lies ahead) in identifying risk for clinically significant levels of depression and anxiety among cancer survivors

Methods

- 1436 survivors enrolled in the Cancer Support Community's online Cancer Experience Registry and completed the 25-item CSS and PROMIS-29, a quality of life measure that includes items assessing depression and anxiety
- Pearson correlations (r), area under the curve (AUC), and positive/negative predictive values (PPV/NPV) were calculated using a cut-off reference of $T \geq 60$ for PROMIS-Depression and ≥ 62 for PROMIS-Anxiety, and confirmatory factor analysis (CFA)

Participants

	N = 1436	Mean / n	SD / %
Age (years)		58.4	11.1
		Range: 19.71–87.24	
Non-Hispanic White	1291		90%
Female	1035		72%
Diagnosis			
Breast	504		35%
Multiple Myeloma	281		20%
CLL	127		9%
Lung	65		5%
Prostate	54		4%
Ovarian	50		3%
Time since diagnosis (years)		4.6	5.3
		Range: 0–52	
Ever metastatic	302		26%
Ever experienced recurrence/ relapse	261		22%
Currently receiving treatment	770		54%

Results

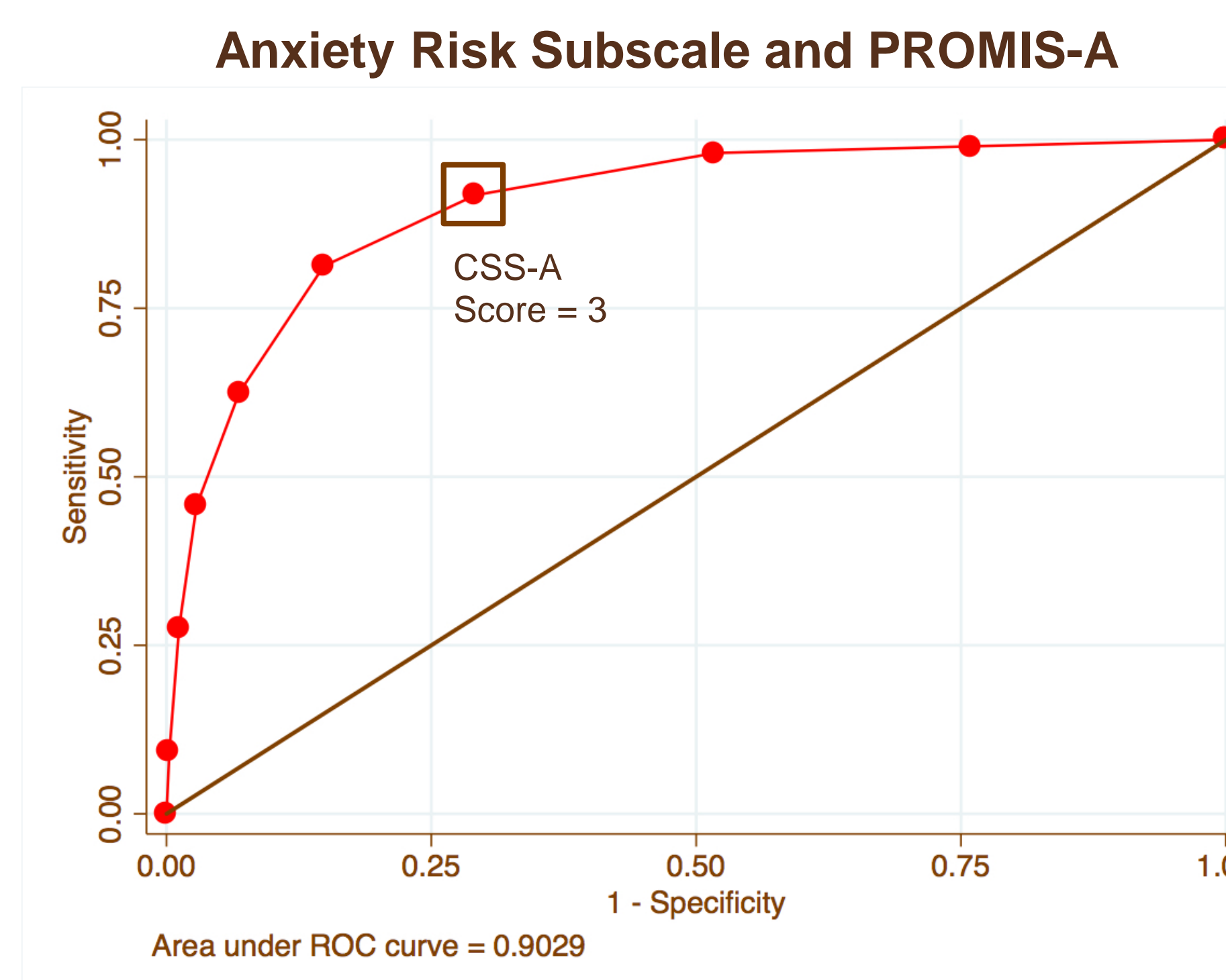
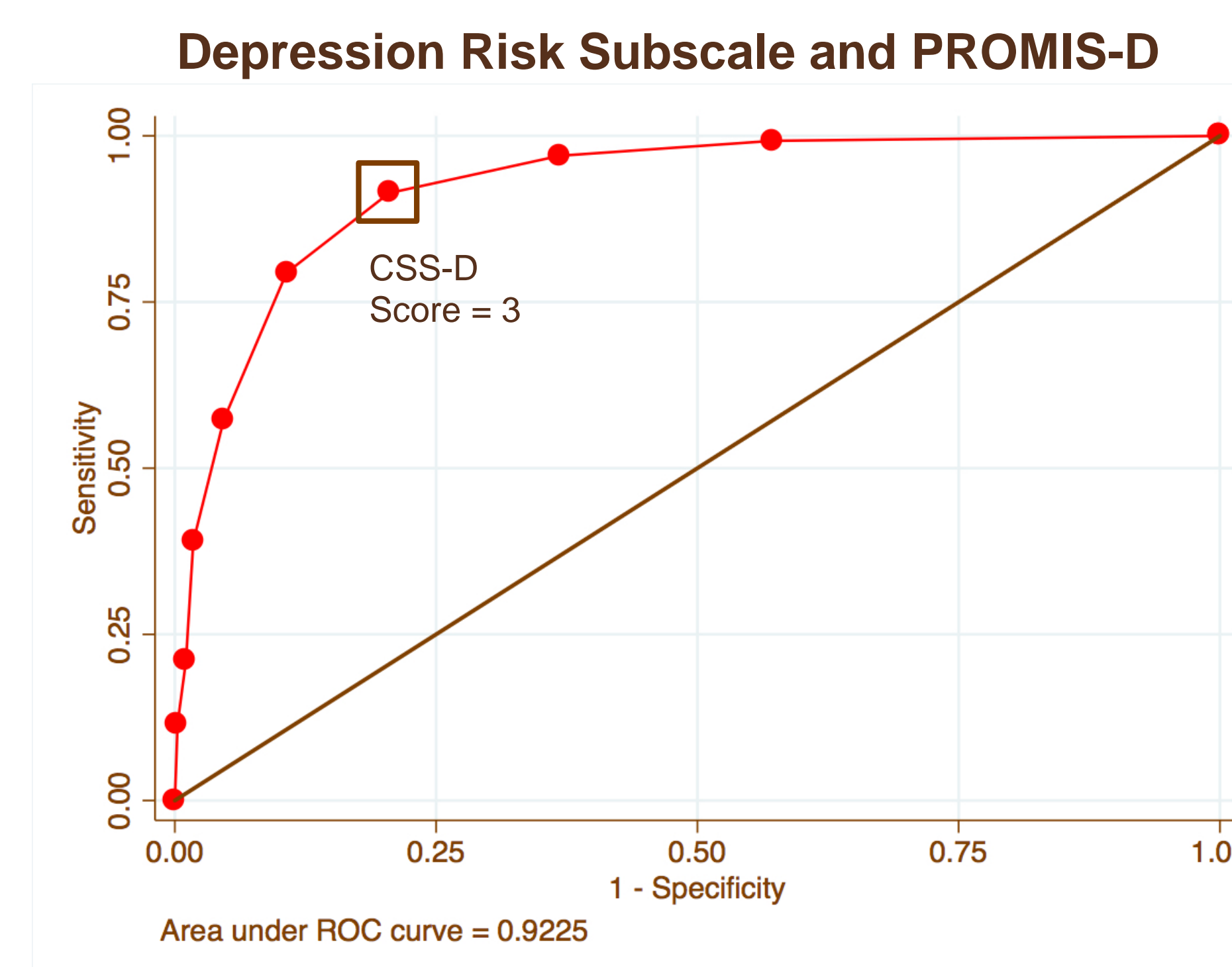
Pearson Correlations with PROMIS Depression and Anxiety Scales

	Cronbach's α	Mean/SD	PROMIS Subscales	
			Depression	Anxiety
CSS Depression (CSS-D)	.83	2.02/2.16	0.79	0.70
CSS Anxiety (CSS-A)	.83	2.55/2.15	0.69	0.74

- CSS-D was strongly correlated with PROMIS-Depression ($r=.79, p<.001$)
- CSS-A was strongly correlated with PROMIS-Anxiety ($r=.74, p<.001$)
- CSS-D and CSS-A demonstrated good internal consistency reliability ($\alpha = .83$)

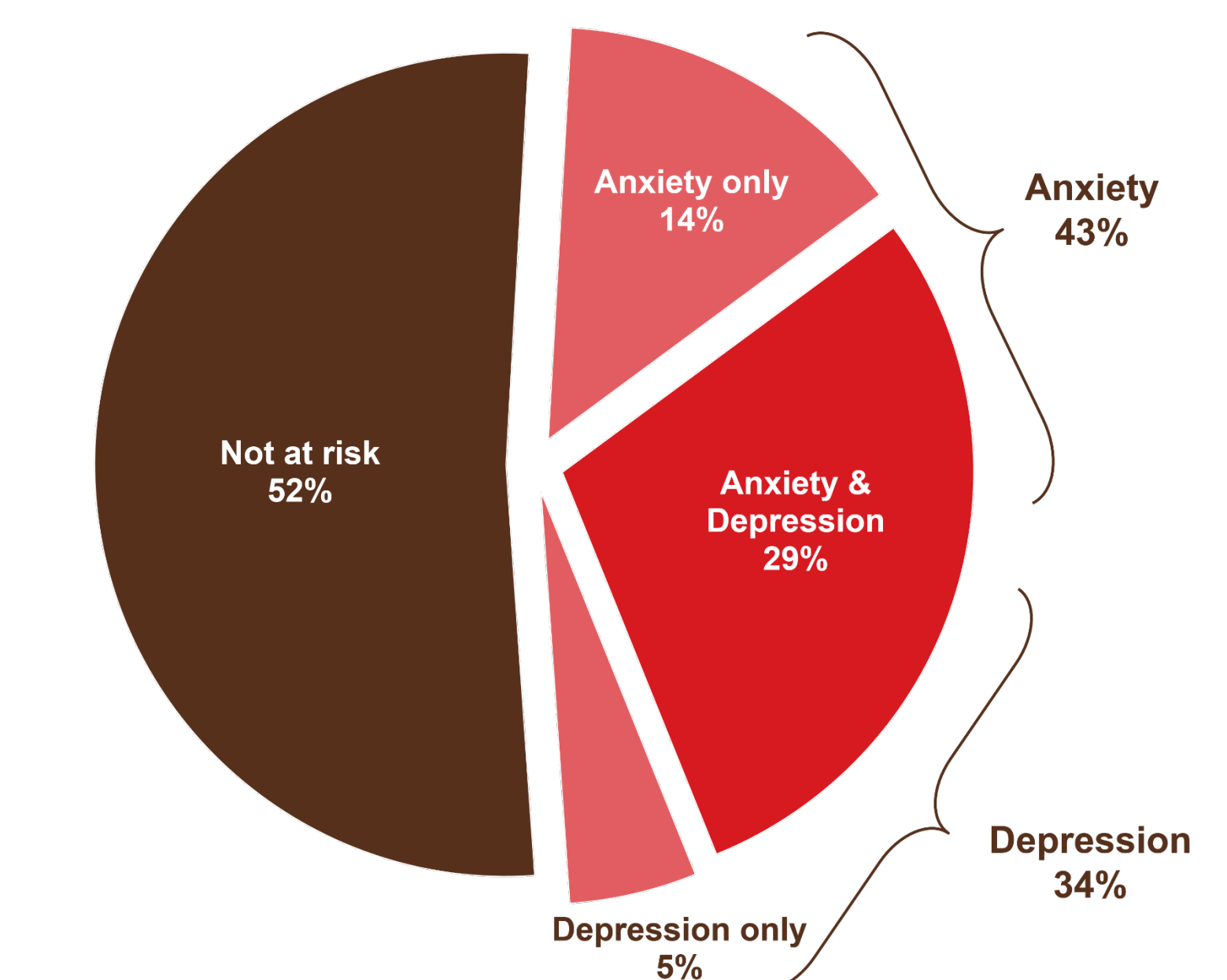
ROC Curve Analysis

CSS Risk Scale	PROMIS-29 Comparison Measure	AUC	Cutoff	Sensitivity	Specificity
Depression	Depression subscale, $T \geq 60$.923	2	98.0	48.2
			3	91.8	70.9
			4	81.3	85.2
Anxiety	Anxiety subscale, $T \geq 62$.903	2	98.0	48.2
			3	91.8	70.9
			4	81.3	85.2



- AUCs were $>.900$ for depression and anxiety indicating strong accuracy at classifying people at risk
- The ROC curve (red) shows the tradeoff between sensitivity and specificity. A score of 3 for depression and anxiety subscales maximizes sensitivity with an acceptable specificity for screening
- CSS-D total score ≥ 3 yielded sensitivity $=.91$, specificity $=.79$, NPV $=.98$, PPV $=.51$
- CSS-A total score ≥ 3 yielded sensitivity $=.92$, specificity $=.71$, NPV $=.97$, PPV $=.47$

Risk for Clinically Significant Depression and Anxiety



- 34% of participants were identified as at risk for clinically significant depression; 43% of participants were identified as at risk clinically significant anxiety
- 29% were identified as at risk for both clinically significant depression and anxiety
- Individuals screened to be at risk are recommended to undergo more comprehensive assessment to determine appropriate diagnosis (if any), support, and/or treatment

Confirmatory Factor Analysis

Item	Factor 1	Factor 2
Feeling nervous or afraid	.87	--
Worrying about the future and what lies ahead	.82	--
Feeling sad or depressed	--	.81
Feeling lonely or isolated	--	.88

- Confirmatory factor analysis demonstrated that the depression and anxiety risk subscales were related but distinct
- A 2-factor model indicated good fit (RMSEA=0.076; SRMR=0.008; CFI=0.998; $\chi^2(1)=9.13, p<.005$) and explained 71% of the variance
- Anxiety items had high loadings (.87, .82) on the first factor and depression items had high loadings (.81, .88) on the second factor

Conclusions

- The concurrent and criterion validity of CancerSupportSource® depression and anxiety risk subscales was confirmed among cancer survivors
- Using cutoff scores of 3 or greater for both subscales yielded favorable sensitivity, although specificity was low
- CSS-D and CSS-A risk assessment scales should be used for screening of clinically-significant levels of depression and anxiety, not diagnosis
- Sites utilizing these measures should have well-defined follow-up procedures for individuals who screen positive, including referral for further assessment
- Future research on applications of CSS-D and CSS-A should include structured diagnostic interviews for further validation of risk cutoffs

Acknowledgments

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References

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- The Registry is for all cancer survivors and caregivers, but also includes 10 disease-specific surveys.
- Findings contribute toward advancing research, health care and policy.
- Over 12,000 cancer survivors and caregivers are registered in the Cancer Experience Registry.

Learn more or join the Registry at www.CancerExperienceRegistry.org