Operating Characteristics of the Single-Item PTSD Screener (SIPS)

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INTRODUCTION

Brief screening instruments are often used in primary care and high-risk settings to screen for a variety of mental health disorders, including PTSD. The 4-item PC-PTSD (Primary Care PTSD Screen) is currently used in many settings to screen for PTSD (i.e., Military Health System, Veterans Affairs) using a two-stage approach. The two-stage approach screens the general population with a brief screener, and only patients who screen positive are subsequently administered a lengthier screening assessment. Population-level screening necessitates a validated PTSD screening tool that minimizes patient and provider burden in busy primary care clinics.

Building upon prior work by this team (Gore et al., 2008), we used a data-driven approach to refine and test two versions of a Single-Item PTSD Screener (SIPS A and SIPS B) for use in military primary care settings.

AIMS

1. Examine psychometric properties of two versions of a single-item PTSD screen (SIPS A and SIPS B), relative to the 4-item PC-PTSD and the 17-item PCL-C (civilian version).
2. Compare operating characteristics to determine optimal cut points for clinical use of the SIPS A and SIPS B.

METHODS

Sample
- 437 participants were recruited from Walter Reed National Military Medical Center Primary Care Clinic (WRNMMC) waiting room.
- Strategic, representative sampling technique.
- 10% PTSD positive (based on MINI-PTSD (Mini International Neuropsychiatric Interview)).

Measure development
- SIPS A: Face-valid, summary question
  - Developed through strategic refinements to the original SIPS.
- SIPS B: Symptom-driven question
  - Based on PCL-C items determined to have strongest predictive power for PTSD diagnosis through secondary analysis of original SIPS study data.
- Candidate SIPS questions were refined and selected through expert consult and brief cognitive interviews with patients.

Procedures (Figure 1)
- Consented participants completed all study measures.
- Completed MINI-PTSD diagnostic interview with study staff member.
- Completed mailed follow-up packet of PTSD screens.

TABLE 1 – SAMPLE CHARACTERISTICS

Demographics N = 437		% or Mean (SD)
Age		43.7 (13.6)
Sex	Male	48%
Race	White	67%
	Black or African Am.	20%
Ethnicity	Not Hisp. or Latino	89%
Education	Some College	94%
Service Affiliation	Active Duty	36%
	Veteran/Retired	31%
	Family Member	28%
Branch of Service	Army	30%
	Navy	23%
Rank	Officer	32%
	Enlisted	39%
Deployed	OIF/OEF/Other	39%

Clinical Indicators N = 437		% or Mean (SD)
PTSD	PC-PTSD	32% pos.
	PCL	18% pos.
	MINI	10% pos.
Somatoform Dis.	PHQ-15	13% pos.
Depression	PHQ-9	12% pos.
Panic Dis.	PHQ-Panic Dis.	9% pos.
Generalized Anx.	PHQ-Gen. Anx.	7% pos.
Alcohol Screen	AUDIT-C	27% pos.
TBI (OIF/OEF)	VA-TBI	4% pos.
Health-Rel. QoL	SF-12	
Physical Func.	PCS Score	48.0 (10.7)
Mental Func.	MCS Score	47.6 (11.9)
Pain Intensity	Numeric Pain Rating Scale	2.4 (2.3)

TWO VERSIONS OF THE SIPS

SIPS A

Think about the biggest threat to life you've EVER witnessed or experienced first-hand. In the PAST MONTH, how much have you been bothered by this experience?

0 1 2 3 4 5 6 7 8 9 10

Not Bothered at all — **Extremely Bothered**

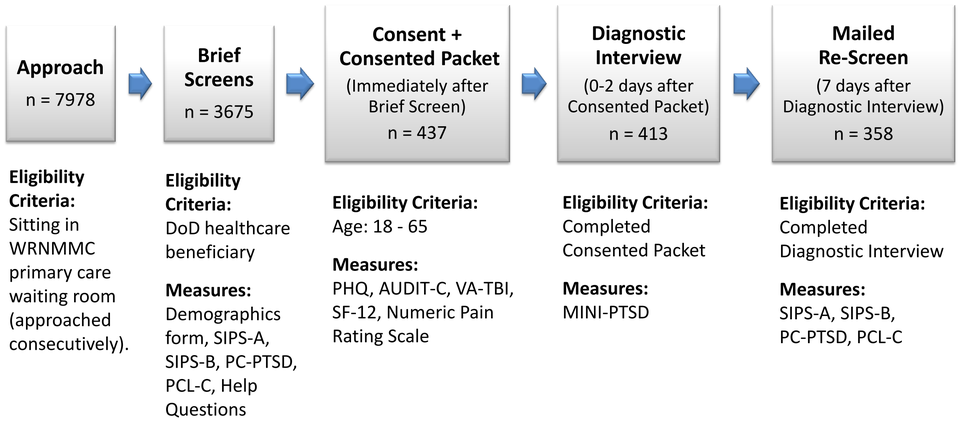
SIPS B

Think about the biggest threat to life you've EVER witnessed or experienced first-hand. In the PAST MONTH, how much have you been bothered by disturbing memories, feeling distant from others, or avoiding certain activities as a result of this experience?

0 1 2 3 4 5 6 7 8 9 10

Not Bothered at all — **Extremely Bothered**

FIGURE 1 – DATA COLLECTION FLOW CHART



RESULTS

- Binomial logistic regression was applied to construct ROC curves for SIPS A, SIPS B, and PC-PTSD (Figure 2).
- Chi-square comparisons of areas under the curves (AUC) determined equivalence among the SIPS A, SIPS B, and PC-PTSD:
  - SIPS A and SIPS B did not differ statistically ($X^2 = 1.35$, p-value = 0.25; AUC = 0.85 vs. 0.88).
  - SIPS B and PC-PTSD did not differ statistically ($X^2 = 0.25$, p-value = 0.62; AUC = 0.88 vs. 0.89).
  - SIPS A and PC-PTSD did not differ statistically ($X^2 = 1.82$, p-value = 0.18; AUC = 0.86 vs. 0.89).
- The PCL-C performed better than the PC-PTSD ($X^2 = 3.83$, p-value = 0.05; AUC = 0.93 vs. 0.89), SIPS A ($X^2 = 9.94$, p-value = 0.002; AUC = 0.93 vs. 0.86), and SIPS B ($X^2 = 4.82$, p-value = 0.03; AUC = 0.93 vs. 0.88).
- Evaluation of psychometric data and chi-squares based on a two-stage screening approach (SIPS A/B→PCL-C) identified the optimal cut point for SIPS A and B = 3 to balance sensitivity/specificity and positive/negative predictive values (See Table 2 for operating characteristics).
- Multivariate binomial logistic regression analyses determined the PC-PTSD better predicted PTSD compared to the SIPS A and SIPS B ($X^2 = 171.889$ vs. 228.216, $p < 0.01$; $X^2 = 171.889$ vs. 215.124, $p < 0.01$).
  - Additional predictors (e.g., age, sex, military status) will be used to control for bias and identify true performance.

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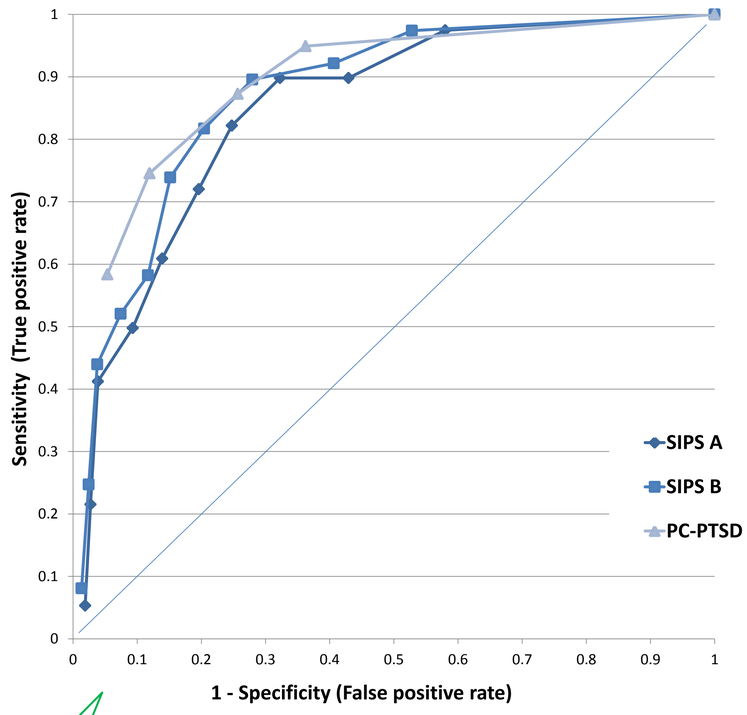
FIGURE 2 – EQUIVALENT AREA UNDER ROC CURVES



Sensitivity, specificity, and AUC reflect test validity.

Positive and negative predictive values reflect the clinical utility of the test; e.g., we can be 98% positive that patients who screen negative do not have PTSD.

TABLE 2 – OPERATING CHARACTERISTICS OF CLINICALLY USEFUL CUTPOINTS

	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)	DE (95% CI)
SIPS A (cut point = 3)	0.90 (.81-.99)	0.68 (.63-.73)	0.23 (.17-.30)	0.98 (.97-1.00)	0.70 (.66-.74)
SIPS B (cut point = 3)	0.90 (.80-.99)	0.72 (.68-.77)	0.26 (.18-.33)	0.99 (.97-1.00)	0.74 (.70-.78)
PC-PTSD (cut point = 2)	0.87 (.77-.98)	0.74 (.70-.79)	0.27 (.20-.35)	0.98 (.97-1.00)	0.76 (.72-.80)
PCL-C (1-3-2 criteria)	0.70 (.56-.84)	0.89 (.86-.92)	0.42 (.30-.54)	0.97 (.95-.98)	0.87 (.84-.91)

PPV = Positive predictive value; NPV = Negative predictive value; DE = Diagnostic efficiency.

CONCLUSIONS

- The Single-Item PTSD Screener (SIPS) performs similarly to the already-in-use 4-item PC-PTSD in a DoD primary care sample, but not as well as the 17-item PCL-C.
- If used as the initial screener in a two-stage screening process, a cut point of 3 on the SIPS A or B is appropriate for identifying patients who should undergo further assessment for PTSD.
- Preliminary findings suggest the PC-PTSD may predict PTSD better than the SIPS A and B.
- As a whole, these findings suggest that the SIPS A and SIPS B are promising ultra-brief screening instruments for military primary care.