Validation and Acceptability of the PTSD Primary Care Screen for DSM-5

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POLL QUESTION 1

- What is your primary role in VA?
  - student, trainee, or fellow
  - clinician
  - researcher
  - Administrator, manager or policy-maker
  - Other

PTSD AND *DSM-5*

- In 2013, the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*) was introduced

- The PTSD diagnosis underwent substantial changes

- Changes included:
  - Categorized as a Trauma- and Stressor-Related Disorder
  - Criterion A
  - Division of Avoidance/Numbing cluster into two separate criterion:
  - Minor wording changes to 10 of the original 17 symptoms
  - Addition of three new symptoms, resulting in symptom count of 20

PTSD AND *DSM-5*

- *DSM-5* PTSD Criteria:
  - Criterion A: Stressor Criterion
  - Criterion B: Intrusion Criterion
  - Criterion C: Avoidance Criterion
  - Criterion D: Negative Alterations in Cognition or Mood Criterion
  - Criterion E: Arousal and Reactivity Criterion
  - Criterion F: Duration
  - Criterion G: Clinically Significant Distress/Impairment
  - Criterion H: Not attributable to effects of substance/medical condition

PTSD AND *DSM-5*

- PTSD affects a large minority of Veterans
- According to 2018 Northeast Program Evaluation Center (NEPEC) Report:
  - 11.6% VHA users have PTSD
  - 11.0% male VHA users have PTSD
  - 17.7% female VHA users have PTSD
  - 26.8% OEF/OIF VHA users have PTSD
- PTSD associated with:
  - Impaired functioning and quality of life
  - Poor physical health
  - Comorbid psychiatric disorders

- Screening for PTSD in VHA is crucial
  - Goal of screening to identify those at risk for PTSD/with undiagnosed PTSD for the purposes of intervention
  - VA has mandated PTSD screening
    - First 5 years after separation
    - Every 5 years thereafter
  - Most screening conducted in primary care

PTSD AND *DSM-5*

- Primary Care PTSD screen (PC-PTSD) has been used in VHA
- Reflects *DSM-IV* criteria

In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, <u>in the past month</u>, you…	
1. Have had nightmares about it or thought about it when you did not want to?	YES/NO
2. Tried hard not to think about it or went out of your way to avoid situations that reminded you of it?	YES/NO
3. Were constantly on guard, watchful, or easily startled?	YES/NO
4. Felt numb or detached from others, activities, or your surroundings?	YES/NO

PTSD AND *DSM-5*

- PC-PTSD revised to reflect *DSM-5* criteria: the Primary Care PTSD Screen for *DSM-5* (PC-PTSD-5)

- Two major changes:
  - Addition of trauma prompt
  - Reflection of new criterion

Sometimes things happen to people that are unusually or especially frightening, horrible, or traumatic. For example, a serious accident or fire, physical or sexual assault or abuse, earthquake or flood, war, seeing someone be killed or seriously injured, or having a loved one die through homicide or suicide. Have you ever experienced this kind of event?	**YES/NO**
If no, screen total = 0; if yes, continue with screening. In the past month, have you…	
1. Had nightmares about the event(s) or thought about the event(s) when you did not want to?	YES/NO
2. Tried hard not to think about the event(s) or went out of your way to avoid situations that reminded you of the event(s)?	YES/NO
3. Been constantly on guard, watchful, or easily startled?	YES/NO
4. Felt numb or detached from others, activities, or your surroundings?	YES/NO
5. Felt guilty or unable to stop blaming yourself or others for the event(s) or any problems the event(s) may have caused?	YES/NO

PTSD AND *DSM-5*

- PC-PTSD-5 demonstrated strong psychometric properties in pilot studies

- Needed to be validated in a primary care sample using a gold-standard instrument for PTSD to identify the optimal cutoff score
  - Cutoff on *DSM-IV* version is 3 (out of 4)

CURRENT STUDY: AIMS

- Identify the optimal cutoff score for the PC-PTSD-5 in primary care using a gold-standard PTSD interview
- Determine if the optimal cutoff score varies across Veteran sub-populations
- Gather initial data on the acceptability of the PC-PTSD-5 to Veterans

CURRENT STUDY: METHOD

- 495 Veterans across two VA sites completed self-report measures within 7-days of a primary care appointment (Session 1)

- 429 of these Veterans (86.7%) participated in a phone interview (Session 2)
  - Goal: within 30 days of Session 1
  - *M* = 12.04 days; only 3 participants outside of 30-day window

CURRENT STUDY: METHOD

- Measures:
  - Session 1:
    - Demographic characteristics
    - Other screening measures (e.g., PHQ-9, AUDIT, MST)
    - PTSD Checklist for *DSM-5* (PCL-5)
  - Session 2:
    - PC-PTSD-5
    - PC-PTSD-5 Acceptability Questionnaire
    - Mini International Neuropsychiatric Interview (MINI) Suicide Module
    - Life Events Checklist for *DSM-5*
    - Clinician Administered PTSD Scale for *DSM-5*

CURRENT STUDY: METHOD

- Final Sample (N = 399)
  - Sex at birth:
    - 334 (83.7%) male
    - 64 (16.0%) female
  - Race:
    - 297 (74.4%) White
    - 69 (17.3%) Black
    - 16 (4.0%) Asian
    - 12 (3.0%) American Indian/Native American
    - 6 (1.5%) Hawaiian/Pacific Islander
    - 22 (5.5%) Other
  - Ethnicity: 28 (7.0%) identified as Spanish/Hispanic/Latinx

- Completers vs. Non-Completers
  - Non-completers were significantly more likely to be:
    - Hispanic ($X^2 = 7.78$; $p = .005$)
    - Separated from their spouse ($X^2 = 7.33$; $p = .007$)
    - Employed for wages ($X^2 = 7.61$; $p = .006$)

- Data Analyses:
  - Use diagnostic utility analyses to identify the optimal cutoff score overall and for sub-groups of interest
  - Examine descriptive statistics to gather initial data on the acceptability of the PC-PTSD-5

CURRENT STUDY: DIAGNOSTIC UTILITY ANALYSES

		PC-PTSD-5 (Test)	
		Yes	No
CAPS-5 (Criterion)	Yes	TP	FN
	No	FP	TN

- Calculate series of 2X2 contingency tables for each version of the Criterion by each level of the Test
  - True Positives (TP = PTSD+ and PC-PTSD-5+)
  - False Positives (FP = PTSD- and PC-PTSD-5+)
  - True Negatives (TN = PTSD- and PC-PTSD-5-)
  - False Negatives (FN = PTSD+ and PC-PTSD-5-)

- For each 2X2 contingency table, calculate measures of test performance and test quality

CURRENT STUDY: DIAGNOSTIC UTILITY ANALYSES

- Test Performance Measures:
  - Sensitivity (SE) - ability of the test to correctly identify all patients with the disease
  - Specificity (SP) – ability of the test to correctly identify all patients without the disease
  - Efficiency (Eff) - proportion of correctly classified participants among all participants

CURRENT STUDY: DIAGNOSTIC UTILITY ANALYSES

- Test Performance Measures:
  - Positive predictive value (PPV) – probability of having the disease in a participant with a positive test result
  - Negative predictive value (NPV) – probability of not having a disease in a participant with a negative test result

CURRENT STUDY: DIAGNOSTIC UTILITY ANALYSES

- Test Performance Measures:
  - Positive likelihood ratio (+LR) –how much more likely the positive test result is to occur in participants with the disease compared to those without the disease
    - Ideally ≥ 5 (30% more likely)
  - Negative likelihood ratio (-LR) – how much less likely the negative test result is to occur in a patient without disease compared to those with the disease
    - Ideally ≤ .2 (30% less likely)

CURRENT STUDY: DIAGNOSTIC UTILITY ANALYSES

- Test Quality Measures:
  - Measures of diagnostic utility corrected for chance
  - Fixed endpoints of 0.00 (indicating chance agreement) and 1.00 (indicating perfect agreement)
  - Include:
    - Quality of sensitivity (κ[1])
    - Quality of specificity (κ[0])
    - Quality of efficiency/Cohen's κ (κ[.5])

CURRENT STUDY: DIAGNOSTIC UTILITY ANALYSES

- **Optimally sensitive cutoffs**
  - Increase True Positives and decrease False Negatives
  - Also increase False Positives
- **Optimally specific cutoffs**
  - Increase True Negatives and decrease False Positives
  - Increase False Negatives
- **Optimally efficient cutoffs**
  - Balance False Positives and False Negatives
  - Maximize proportion of correctly classified participants

RESULTS: AIM 1

- Examined 5-levels of PC-PTSD-5 across four CAPS-5 diagnostic definitions:
  - Lenient (*DSM-5* algorithm – no severity requirement)
  - Best fit for the data (*DSM-5* algorithm + severity ≥ 22)
  - **Moderate (*DSM-5* algorithm + severity ≥ 23)**
  - Severe (*DSM-5* algorithm + severity ≥ 26)

- Comparison of two cutoff scores:
  - Optimally sensitive with acceptable specificity (~.80)
  - Optimally efficient

AIM 1 – MODERATE CAPS-5 DEFINITION – N = 399 (16.5% MEET CRITERIA FOR PTSD)

Cut-score	%(n) with PC-PTSD-5 PTSD	FNs n (% of those with CAPS PTSD)	FP n (% of those without CAPS PTSD)	SE	SP	EFF
1	53.6% (214)	1 (1.5%)	149 (44.7%)	.98	.55	.62
2	43.3% (173)	3 (4.5%)	110 (33.0%)	.95	.67	.72
3	**32.1% (128)**	**7 (10.6%)**	**69 (20.7%)**	**.89**	**.79**	**.81**
4	**20.3% (81)**	**15 (22.7%)**	**30 (9.1%)**	**.77**	**.91**	**.89**
5	10.3% (41)	33 (50.0%)	8 (2.4 %)	.50	.98	.90

AIM 1 – MODERATE CAPS-5 DEFINITION – N = 399 (16.5% MEET CRITERIA FOR PTSD)

Cut-score	%(n) with PC-PTSD-5 PTSD	FNs n (% of those with CAPS PTSD)	FP n (% of those without CAPS PTSD)	PPV	NPV	+LR	-LR
1	53.6% (214)	1 (1.5%)	149 (44.7%)	.30	.99	2.20	.03
2	43.3% (173)	3 (4.5%)	110 (33.0%)	.36	.99	2.89	.07
3	**32.1% (128)**	**7 (10.6%)**	**69 (20.7%)**	**.46**	**.97**	**4.31**	**.13**
4	**20.3% (81)**	**15 (22.7%)**	**30 (9.1%)**	**.63**	**.95**	**8.58**	**.25**
5	10.3% (41)	33 (50.0%)	8 (2.4 %)	.80	.91	20.81	.51

AIM 1 – MODERATE CAPS-5 DEFINITION – N = 399 (16.5% MEET CRITERIA FOR PTSD)

Cut-score	%(n) with PC-PTSD-5 PTSD	FNs n (% of those with CAPS PTSD)	FP n (% of those without CAPS PTSD)	SP	K(0)	K(.5)	K(1)
1	53.6% (214)	1 (1.5%)	149 (44.7%)	.55	.17	.28	.97
2	43.3% (173)	3 (4.5%)	110 (33.0%)	.67	.24	.38	.92
3	**32.1% (128)**	**7 (10.6%)**	**69 (20.7%)**	**.79**	**.35**	**.50**	**.84**
4	**20.3% (81)**	**15 (22.7%)**	**30 (9.1%)**	**.91**	**.56**	**.63**	**.71**
5	10.3% (41)	33 (50.0%)	8 (2.4 %)	.98	.77	.56	.44

RESULTS: AIM 1

- Across CAPS-5 definitions, a cutoff of 3 was optimally sensitive and a cutoff of 4 was optimally efficient

- Cutoff of 3 reduces False Negatives, but increases False Positives
  - Positive likelihood ratio < 5
  - Negative likelihood ratio .11-.19

- Cutoff of 4 increases False Negatives, but reduces False Positives
  - Positive likelihood ratio < 5
  - Negative likelihood ratio .17-.30

- Post-hoc analysis:
  - Will adding a PCL-5 severity requirement to a cutoff of 3 improve validity?
    - Used diagnostic utility analyses to identify the optimal cutoff score on the PCL-5 against the CAPS-5 – optimal cutoff score = 32
    - Compared:
      - Cutoff of 3
      - Cutoff of 4 + cutoff of 3 & score of PCL-5 ≥ 32
      - Cutoff of 4

AIM 1 – MODERATE CAPS-5 DEFINITION – N = 386 (16.6% MEET CRITERIA FOR PTSD)

Cut-score	%(n) with PC-PTSD-5 PTSD	FNs n (% of those with CAPS PTSD)	FP n (% of those without CAPS PTSD)	SE	SP	EFF
3	32.4% (125)	7 (10.9%)	68 (21.1%)	.89	.79	.81
4+3/32	25.1% (97)	9 (14.1%)	42 (13.0%)	.86	.87	.87
4	20.5% (79)	14 (21.9%)	29 (9.0%)	.78	.91	.89

Cut-score 4/3+32 = cutoff score of 4 on the PC-PTSD-5 AND cutoff score of 3 on the PC-PTSD-5 plus PCL-5 score ≥ 32

AIM 1 – MODERATE CAPS-5 DEFINITION – N = 386 (16.6% MEET CRITERIA FOR PTSD)

Cut-score	%(n) with PC-PTSD-5 PTSD	FNs n (% of those with CAPS PTSD)	FP n (% of those without CAPS PTSD)	PPV	NPV	+LR	-LR
3	32.4% (125)	7 (10.9%)	68 (21.1%)	.46	.97	4.22	.14
4+3/32	25.1% (97)	9 (14.1%)	42 (13.0%)	.57	.97	6.59	.16
4	20.5% (79)	14 (21.9%)	29 (9.0%)	.63	.95	8.67	.24

Cut-score 4/3+32 = cutoff score of 4 on the PC-PTSD-5 AND cutoff score of 3 on the PC-PTSD-5 plus PCL-5 score ≥ 32

AIM 1 – MODERATE CAPS-5 DEFINITION – N = 386 (16.6% MEET CRITERIA FOR PTSD)

Cut-score	%(n) with PC-PTSD-5 PTSD	FNs n (% of those with CAPS PTSD)	FP n (% of those without CAPS PTSD)	SP	K(0)	K(.5)	K(1)
3	32.4% (125)	7 (10.9%)	68 (21.1%)	.79	.35	.49	.84
4+3/32	25.1% (97)	9 (14.1%)	42 (13.0%)	.87	.48	.60	.81
4	20.5% (79)	14 (21.9%)	29 (9.0%)	.91	.56	.63	.73

Cut-score 4/3+32 = cutoff score of 4 on the PC-PTSD-5 AND cutoff score of 3 on the PC-PTSD-5 plus PCL-5 score ≥ 32

RESULTS: AIM 1

- In general, a PC-PTSD-5 cutoff of 4 AND 3 with PCL-5 scores ≥ 32 fell between the cutoffs of 3 and 4
  - Cutoff of 3 remained optimally sensitive for all but CAPS-5 strict definition
    - For strict definition, 4+3 with PCL-5 score ≥ 32 was optimally sensitive
  - Cutoff of 4 remained optimally efficient across all definitions

- Post-hoc analysis:
  - Will False Negative Veterans be captured by other VHA screens?
    - Examine False Negatives on:
      - Patient Health Questionnaire-2 (PHQ-2; score ≥ 3)
      - Alcohol Use Disorders Identification Test (AUDIT; score ≥ 8)

RESULTS: AIM 1

	Lenient		Data-Driven		Moderate		Strict	
Cutoff	**3**	**4**	**3**	**4**	**3**	**4**	**3**	**4**
PHQ-2	41.7%	45.5%	71.4%	60.0%	71.4%	60.0%	80.0%	77.8%
AUDIT	33.3%	27.3%	42.9%	33.3%	42.9%	33.3%	20.0%	22.2%
At Least One	58.3%	59.1%	85.7%	73.3%	85.7%	73.3%	80.0%	77.8%

Regardless of CAPS-5 definition or PC-PTSD-5 cutoff score used, the majority of False Negatives screened positive on at least one screening measure used by VHA

RESULTS: AIM 2 – CUTOFF SCORES ACROSS SEX

- Diagnostic utility analyses patterns for men were similar to the overall sample:
  - Men (n = 334)
    - Prevalence of PTSD in men ranged from 12.3%-17.7%
  - Across all four CAPS-5 definitions
    - Cutoff of 3 was optimally sensitive
      - Positive likelihood ratio < 5
      - Negative likelihood ratio .09-.18
    - Cutoff of 4 was optimally efficient
      - Positive likelihood ratio > 5
      - Negative likelihood ratio .13-.25

RESULTS: AIM 2

- Patterns for women were notably different (*n* = 64)
  - Prevalence of PTSD ranged from 25.0%-31.3%
  - Diagnostic utility analyses:
    - Cutoff of 3 optimally sensitive for three of the CAPS-5 definitions
      - Positive likelihood ratio < 4
      - Negative likelihood ratio .15-.21
    - For strict CAPS-5 definition, cutoff of 4 optimally sensitive
      - Positive likelihood ratio = 7.20
      - Negative likelihood ratio = .28
    - Across all four CAPS-5 definitions, cutoff of 5 was optimally efficient
      - Positive likelihood ratio 22-30
      - Negative likelihood ratio .38-.51

RESULTS: AIM 2

Impact on False Negatives – Men vs. Women

Cut	Lenient		Data-Driven		Moderate		Strict	
	Men	Women	Men	Women	Men	Women	Men	Women
3	15.3%	15.0%	10.0%	11.1%	10.4%	11.1%	7.3%	12.5%
4	23.7%	40.0%	18.0%	33.3%	18.8%	33.3%	12.2%	25.0%

Impact on False Positives – Men vs. Women

Cut	Lenient		Data-Driven		Moderate		Strict	
	Men	Women	Men	Women	Men	Women	Men	Women
3	17.5%	27.3%	18.7%	28.3%	19.2%	28.3%	20.5%	31.3%
4	6.6%	11.4%	7.8%	10.9%	8.4%	10.9%	9.2%	10.4%

RESULTS: AIM 3 – ACCEPTABILITY OF THE PC-PTSD-5

- PC-PTSD-5 well accepted by Veterans:
  - Rated as easy/very easy
    - Understandability of questions (93.5%)
    - Answerability of questions (82.1%)
  - Rated as clear/very clear
    - Instructions (96.5%)
  - Rated as comfortable/very comfortable
    - Completing the PC-PTSD-5 at a Primary Care appointment (82.2%)

RESULTS: AIM 3 – ACCEPTABILITY OF THE PC-PTSD-5

- How would Veterans like the PC-PTSD-5 to be administered?
  - Most comfortable being asked by their PCP
    - $M = 1.89$; $SD = .90$
  - Comfortable completing the measure on their own
    - $M = 2.01$; $SD = .97$
    - Significantly less comfortable than PCP ($t = 2.70$; $p < .01$)
  - Least comfortable being asked by nurse/another PCP
    - $M = 2.23$; $SD = 1.07$
    - Significantly less comfortable than on their own ($t = -4.68$; $p < .001$)

DISCUSSION

- The optimal cutoff score for the PC-PTSD-5 is contingent upon the screening goal:
  - Cutoff of 3 is optimally sensitive
    - Increases True Positives and decreases False Negatives
    - Increases False Positives
    - Adding a PCL-5 severity requirement reduces False Positives somewhat
    - Many False Negatives may be identified by other VHA screens
  - Cutoff of 4 is optimally efficient
    - Maximize proportion of correctly classified participants
    - Increases False Negatives

DISCUSSION

- Female Veterans may require a lower cutoff score
  - Although optimally sensitive cutoff was 3, optimally efficient cutoff was 5
  - When a cutoff of 4 was used, a significantly larger % of women (as opposed to men) were classified as False Negatives
    - Better positive likelihood ratio
    - Worse negative likelihood ratio
  - This suggests that a lower cutoff score may be useful among female Veterans

DISCUSSION

- The PC-PTSD-5 was well-tolerated by participants
- Participants would prefer to have the PC-PTSD-5 administered orally by their primary care provider

QUESTIONS?

- Thank you!

- For additional information, contact:
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