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Behaviour Research and Therapy 43 (2005) 585–594

**BEHAVIOUR
RESEARCH AND
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An abbreviated PTSD checklist for use as a screening instrument in primary care

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Received 17 December 2003; received in revised form 25 March 2004; accepted 14 April 2004

Abstract

Although the importance of recognizing posttraumatic stress disorder (PTSD) in primary care has been well-established, routine screening for PTSD remains unfeasible for many primary care clinics because of the length of the available screening instruments. Thus, the purpose of this work was to develop and validate a brief screening tool for PTSD. In Study 1, four short forms of the PTSD Checklist-civilian version were identified that captured a majority of the variance in the measure. In Study 2, the performance of these short forms was evaluated in a separate sample of primary care patients. We found that both two-item and six-item versions have adequate psychometric properties for screening purposes and suggest that the selection of one version over the other depends on the specific needs of each primary care clinic. Published by Elsevier Ltd.

Keywords: Stress disorders; Posttraumatic; Psychometrics; Psychiatric status rating scales

Introduction

Many patients with emotional disorders receive their care exclusively in general medical settings (Regier et al., 1993). Recognizing the importance of increasing the rates of detection and treatment of depression in primary care, the US Preventive Services Task Force recently

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recommended that primary care providers routinely screen for depression (Agency for Healthcare Research and Quality, 2002). There is good reason to believe that many of the same benefits would be derived from screening for anxiety states as well. Like depression, anxiety is generally under-recognized and under-treated by general medical providers (Pini, Perkonig, Tansella, & Wittchen, 1999).

There are a number of reasons why posttraumatic stress disorder (PTSD) is an important condition to be assessed in primary care. A significant number of patients are affected. In a national study of Israeli primary care patients, 7.5% of men and 10.5% of women were found to have PTSD (Taubman-Ben-Ari, Rabinowitz, Feldman, & Vaturi, 2001). Similarly, 11.8% of patients in a US primary care clinic were diagnosed with current PTSD (Stein, McQuaid, Pedrelli, Lenox, & McCahill, 2000). Traumatized individuals are over-represented in primary care partially because of the need for medical care for trauma-related physical injuries (Koss, Koss, & Woodruff, 1991), but chronic PTSD is associated with impaired functioning, increased medical complaints, higher long-term utilization of medical services and reduced quality of life (Kimerling & Calhoun, 1994; Koss et al., 1991; Schnurr, Friedman, Sengupta, Jankowski, & Holmes, 2000; Solomon & Davidson, 1997). Nonetheless, physicians in primary care recognize distress in only half of patients with PTSD and identify PTSD in specific much less frequently; only 2% of patients with presumptive PTSD based on a self-report measure were diagnosed with the disorder (Taubman-Ben-Ari et al., 2001).

The greatest barrier to increased screening in primary care is its feasibility for busy staff and providers. The shortest self-report measures that are validated for screening in primary care, such as the PTSD Checklist-civilian version (PCL-C) (Weathers, Litz, Huska, & Keane, 1994), take approximately 5 min to complete. If a provider is to screen for three or four mental health problems (e.g., depression, panic, PTSD, substance use disorders), the total time quickly rises to 20–30 min. Thus, if we are to advocate for increased screening in primary care (e.g., Lang & Stein, 2002), we must make available good and extremely short screening instruments.

Previous work has shown that the PCL-C has adequate psychometric properties for use with women in primary care (Dobie et al., 2002; Walker, Newman, Dobie, Ciechanowski, & Katon, 2002). The purpose of this paper is to describe the development a brief screening instrument for PTSD to be used with both men and women in primary care.

1. Study 1

The purpose of Study 1 was to generate an abbreviated screening instrument from the set of PCL-C items.

1.1. Method

1.1.1. Participants

Potential participants included all women ($N = 419$) who received care in the VA San Diego Healthcare System primary care clinic in 1998. Two hundred twenty-one women (56%) agreed to participate and returned the measures. In addition, women were asked for permission to contact them for a follow-up interview. One hundred ninety-two (87%) agreed, and 49 (26%) were

Table 1
Demographic characteristics of the study samples

	Sample 1 (<i>n</i> = 221)	Sample 2 (<i>n</i> = 154)
Mean age (SD)	46.6 (14.6) Range 20–86	47.8 (16.5) Range 18–80
<i>Gender</i>		
Male	0	73 (48%)
Female	221 (100%)	79 (52%)
<i>Ethnicity in n (%)</i>		
Caucasian	158 (71%)	88 (57%)
Not Caucasian	63 (29%)	66 (43%)
<i>Marital status in n(%)</i>		
Married/partnered	84 (38%)	81 (53%)
Divorced/separated/widowed	91 (41%)	28 (18%)
Never married	46 (21%)	44 (29%)
<i>Household income in n (%)</i>		
Under \$30,000	153 (74%)	75 (49%)
\$30,000 and over	54 (26%)	77 (51%)
<i>Education in n (%)</i>		
Up to 12 years	22 (11%)	35 (23%)
12–16 years	165 (80%)	80 (52%)
More than 16 years	20 (9%)	38 (25%)

randomly selected for an interview. The interviewed subset appeared to be generally representative of the overall sample.¹ Group demographics are presented in Table 1.

1.1.2. Measures

Among the study materials that these women completed were a demographic questionnaire and the PCL-C, which is a measure of PTSD symptomatology and severity. The reliability and validity of the PCL-C have been established (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Ruggiero, Del Ben, Scotti, & Rabalais, 2003). The PTSD section of the Composite International Diagnostic Interview Version 2.1 (CIDI 2.1) (World Health Organization, 1998) was administered as well. The reliability ($\kappa = .79$) and validity of this instrument have been established (Wittchen, Lachner, Wunderlich, & Pfister, 1998).

1.1.3. Procedures

This study was approved and overseen by the UCSD Human Research Protections Program as part of a broader study of women's health. Women were invited to participate by mailing a letter with a consent form, questionnaires and a return envelope enclosed. They were asked to complete

¹A detailed analysis of the differences between the women who agreed to be interviewed and those who did not and the differences between women who were and were not interviewed is previously published (Lang, Laffaye, Satz, Dresselhaus, & Stein, 2003).

them and return the consent form and completed questionnaires by mail. Twenty-five were returned because the address was incorrect or because the woman had died. A second questionnaire packet was mailed to women who did not respond to the initial mailing within 2 weeks, and a letter was sent to women who did not respond after an additional 3 weeks. The interview was administered by telephone by a nurse practitioner, a doctoral student in psychology and an experienced research assistant. Interviewers were blind to self-report data. There was perfect reliability, $\kappa = 1.0$, on the presence or absence of the PTSD diagnosis based on co-rating audiotapes from a randomly selected set (17% or 35%) of interviews.

1.2. Results

The mean PCL-C score for this group was 39.0 (SD = 18.3, range 17–85). Fifteen (31%) of the interviewed women met criteria for PTSD. There was no significant difference in average PCL-C score between women who were interviewed and those who were not.

Two techniques were used to create an abbreviated instrument. First, corrected item–total correlations (i.e., correlations between the item and the total score with that item removed) were calculated for all 17 items of the PCL-C (refer to Table 2). Three short forms, two-item, three-item and four-item versions, were created using the two, three and four items with the highest correlations with the total, respectively. Next, corrected item–total correlations were calculated

Table 2
Corrected item–total correlations of PCL-C items with total score and cluster scores

Item	Correlation with total	Correlation with cluster
<i>Cluster B</i>		
1. Memories, thoughts or images	.8315	.8793
2. Dreams	.7507	.8316
3. Acting or feeling as if...happening again	.7558	.8376
4. Upset when reminded	.8143	.8596
5. Physical reactions	.7759	.7973
<i>Cluster C</i>		
6. Avoid thinking, talking, feelings	.7452	.6857
7. Avoid activities or situations	.7771	.7593
8. Trouble remembering	.5763	.5471
9. Loss of interest	.7119	.7003
10. Feeling distant or cutoff	.7649	.7718
11. Emotionally numb	.7312	.7384
12. Future will be cut short	.7034	.7215
<i>Cluster D</i>		
13. Trouble sleeping	.6298	.5708
14. Irritable or angry	.7072	.7327
15. Difficulty concentrating	.7414	.7470
16. "Superalert"	.7851	.7206
17. Easily startled	.7732	.7230

for each item and the total for the cluster of which it is a part based on DSM-IV diagnostic criteria (see Table 2). The two items from each cluster with the highest correlations with the cluster score were selected to create a six-item version of the measure. Sums of items were used as scores for the abbreviated versions.

Next, each of the short forms was correlated with the PCL-C total score. The two-item version accounted for 78.7% of the variance ($r = .887$), the three-item version accounted for 85.2% of the variance ($r = .923$), the four-item version accounted for 88.9% of the variance ($r = .943$) and the six-item version accounted for 94.3% of the variance ($r = .971$).

ROC curves were used to examine the performance of the abbreviated forms as compared to the CIDI.² The area under the curve, which reflects the overall accuracy of a measure as compared to the CIDI diagnosis, was .73 for the two-item measure, .78 for the three-item measure, .82 for the four-item measure, .84 for the six-item measure and .84 for the total score. Reasonable cutoff scores could be identified for each version: a cutoff of 4 (i.e., greater than or equal to 4) on the two-item version results in a sensitivity of .80 and a specificity of .65, a cutoff of 5 on the three-item version results in a sensitivity of .90 and a specificity of .60, a cutoff of 8 on the four-item version results in a sensitivity of .80 and a specificity of .70, and a cutoff of 14 on the six-item version results in a sensitivity of .80 and a specificity of .76. Using a cutoff of 30, which we have previously suggested to be the most appropriate for primary care settings (Lang et al., 2003), the PCL-C has a sensitivity of .78 and a specificity of .71 in this sample. Using the more traditional cutoff of 50, the PCL-C has a sensitivity of .39 and a specificity of .94 in this group.

1.3. Discussion

This data set was used to preliminarily investigate whether the PCL-C could be reduced to fewer items and remain a meaningful screening tool for PTSD in primary care patients. Four potentially viable alternatives were generated. These alternatives contain two, three, four and six items. With the inclusion of more items, there is a higher correlation with the total scale and better specificity. These advantages must be weighed against the need for the shortest instrument possible because of the demands of the primary care setting.

There are several limitations to this study that deserve mention. The sample is comprised entirely of women. Questionnaires were returned by mail, which differs from the usual way in which the measure would be used and precludes knowing exactly when the measure was completed. The 56% response rate raises some concerns about generalizability. For these reasons, it was important to test our findings in a separate sample.

2. Study 2

The purpose of Study 2 was to test in a separate sample the psychometric properties of the screening tools that were generated in Study 1. One always expects a measure to perform more poorly in samples other than the one in which it was developed, so this study is important in evaluating the efficiency of the abbreviated measures.

²ROC curves are available from the first author upon request.

2.1. Method

2.1.1. Participants

Potential participants included individuals who received primary health care from the VA or UCSD primary care clinics in 2002–2003. Research assistants approached patients in waiting rooms about participation in the study; approximately 60% agreed. Four hundred one individuals enrolled. PCL-C data were available for 275 (65.2%) participants and CIDI data were available for 186 (44.1%) participants; 154 (36.5%) had both types of information available. The demographic characteristics of the individuals with both types of information are presented in Table 1. There were no differences between the total enrolled group and this subset in age, gender, ethnicity, education or income. Those with the PCL-C and CIDI were more likely to be married/partnered than those without both data points ($\chi^2 = 6.87, p < .05$).

2.1.2. Measures

As in Study 1, among the study materials were a demographic questionnaire and the PCL-C. The CIDI 2.1 was used to establish psychiatric diagnoses.

2.1.3. Procedures

This work is a part of a broader study of the behavioral health of medical patients, which was overseen by the UCSD Human Research Protections Program. Participants completed the consent form and a short set of instruments in the waiting room. They were paid \$10 for their effort. Participants were then given an additional set of questionnaires, including the PCL-C, and a return envelope and asked to complete and mail back the instruments. They received an additional payment of \$20 upon receipt of these forms. Finally, a randomly selected half of those who completed forms in the waiting room were selected for a diagnostic interview. They were paid \$20 for completing the interview by phone. All interviews were completed by the PI (AJL), a licensed clinical psychologist, or by trained research assistants under her supervision. Research assistant training included observing 3–5 interviews and then being observed until they completed five interviews for which their diagnoses matched those of the PI. All unobserved interviews were presented to the PI to confirm diagnoses. All interviewers were blind to self-report data.

2.2. Results

The mean PCL-C score in this group was 33.3 (SD = 15.5, range 17–85). Twenty-four individuals (16%, including 20 women and four men) who were interviewed met diagnostic criteria for PTSD. There was no significant difference in average PCL-C score for those who were and were not interviewed, $t(273) = .39, ns$.

The PCL-C total score and scores (sums) for the two-, three-, four- and six-item versions created in Study 1 were calculated. Each of the abbreviated versions was correlated with the total score. The two-item version accounts for 72.4% of the variance ($r = .851$), the three-item version accounts for 79.7% of the variance ($r = .893$), the four-item version accounts for 83.7% of the variance ($r = .915$) and the six-item version accounts for 91.8% of the variance ($r = .958$).

Again, ROC curves were used to relate the PCL-C total score and the short form total scores with the CIDI diagnosis (see footnote 2). The area under the curve was .88 for the two-item

Table 3

Measures of diagnostic value for the PCL-C two-item, six-item and 17-item total scores

	Sensitivity	$\kappa(1, 0)$	Specificity	$\kappa(0, 0)$	Efficiency	$\kappa(.5, 0)$
Two-item (cutoff 4)	.96 ($\pm .20$)	.92	.58 ($\pm .03$)	.16	.64 ($\pm .04$)	.28
Six-item (cutoff 14)	.92 ($\pm .19$)	.87	.72 ($\pm .06$)	.26	.75 ($\pm .06$)	.40
17-item (cutoff 30)	.96 ($\pm .20$)	.92	.59 ($\pm .05$)	.17	.65 ($\pm .04$)	.29
17-item (cutoff 50)	.54 ($\pm .06$)	.47	.94 ($\pm .08$)	.54	.88 ($\pm .07$)	.51

Values were calculated as follows: sensitivity (SE) = TP/P , $\kappa(1, 0) = [SE - Q]/Q'$, specificity (SP) = TN/P' , $\kappa(0, 0) = [SP - Q']/Q$, efficiency (EFF) = $[TP + TN]/N$, $\kappa(.5, 0) = [EFF - PQ - P'Q']/[1 - PQ - P'Q']$, where TP = true positive, FN = false negative, TN = true negative, FP = false positive, $P = FN + TP$, $P' = TN + FP$, $Q = FP + TP$, $Q' = N - Q$ (Kraemer, 1992).

measure, .86 for the three-item measure, .86 for the four-item measure, .89 for the six-item measure and .90 for the total score. Using the cutoffs identified in Study 1, two-item version results in a sensitivity of .96 and a specificity of .58, the three-item version a sensitivity of 1.0 and a specificity of .51, the four-item version a sensitivity of .83 and a specificity of .68, and the six-item version a sensitivity of .92 and a specificity of .72. The diagnostic efficiency, i.e., the proportion correctly diagnosed by an instrument (Kraemer, 1992), was calculated. In addition, kappa coefficients, which can be crudely interpreted as “attributable risk”, were calculated for each index to correct for the uncalibrated nature of the indices (Kraemer, 1992) (see Table 3). In the interest of comparing more directly to the sample in Study 1, we calculated these indices among women; this was not feasible with men because of the small number with a PTSD diagnosis. Among women, the two-item version has in a sensitivity of .95 and a specificity of .50, the three-item version a sensitivity of 1.0 and a specificity of .47, the four-item version a sensitivity of .85 and a specificity of .62, the six-item version a sensitivity of .95 and a specificity of .69 and the total score (cutoff of 30) a sensitivity of 1.0 and a specificity of .57.

2.3. Discussion

This second study was to test in a separate sample the diagnostic value of the abbreviated versions of the PCL-C identified in Study 1. The two-item and six-item versions preliminarily appeared to be the best short forms. The two-item version has the advantage of being the shortest instrument. Its overall accuracy and sensitivity are on par with the other measures, although specificity is sacrificed. The three-item version has a lower specificity, and the sensitivity drops for the four-item version, so there appears to be little benefit in including these additional items. The six-item version maintains sensitivity over .90 and produced improved specificity, although its increased length is a disadvantage. Two of our identified abbreviated instruments, a two-item and a six-item versions of the PCL-C, retained good psychometric properties and appear to be potentially useful screening instruments. The two-item version offers brevity but has relatively poor specificity. Thus, there will be an excessive number of false positives, which may waste time on unnecessary follow-up and reduce providers' faith in the instrument. The six-item version is longer but results in better specificity. The final decision as to which instrument to recommend will

depend on the needs of each clinical setting and the expected prevalence of trauma-related symptoms.

This study has limitations as well. The method of collecting data, mailing back the PCL-C and interviewing by telephone, differs from the way in which the instrument would be used in practice and is suboptimal because of the time lag between completing the self-report instrument and the interview. In addition, overall participation rate limits the generalizability of the findings. Future studies should address these limitations and compare these short forms to other short PTSD screening devices, such as the seven-item interview-based scale developed by Breslau, Peterson, Kessler, and Schultz (1999) or Carlson's (2001) brief self-report measure.

2.4. *General discussion*

Recognition of the impact of trauma-related symptoms in primary care settings has raised the question of how to best identify and address the needs of affected individuals. Although screening alone has little demonstrated effectiveness for improving patient outcomes, screening can be an important part of a coordinated system of care for identified individuals (Agency for Healthcare Research and Quality, 2002). Thus, it is important to develop brief and informative tools to identify traumatized patients in general medical settings. The onus then rests on primary care clinics to develop a system of accurately diagnosing patients who screen positive and making available treatment approaches that are both effective and acceptable to primary care patients.

This work shows that a commonly used PTSD assessment tool, the PCL-C, can successfully be reduced to very few items for use as a screening instrument. Although there were significant differences between this sample and the sample from which the abbreviated versions were derived, the diagnostic value of the instruments was well maintained. The correlations between the PCL-C total score and the abbreviated versions as well as the overall accuracy of the instruments remained very similar to those in the original sample.

Selecting an appropriate screening tool for a particular setting will depend on a range of factors, including the feasibility of administering and scoring the instrument and the diagnostic value of the instrument. As the health care system has increased the emphasis on prevention and early recognition of illness, multiple behaviors and disorders have begun to "compete" for screening time. Many patients do not arrive with sufficient lead-time before their appointments to complete lengthy instruments. High staff workloads do not permit scoring procedures that are complicated or time consuming. An instrument with poor sensitivity is inefficient because it will fail to identify too many affected individuals. Poor specificity wastes time by requiring follow-up on false positive cases and risks the loss of providers' buy-in to the program. Higher prevalence of PTSD will increase the positive predictive value of the instrument (i.e., the proportion of positive screenings who have PTSD), so screening may best be applied in clinics with high rates of trauma (e.g., VA, inner city). In sum, careful planning should be undertaken before implementing any screening program.

These instruments were derived in populations that may not be broadly representative of primary care patients, and there was self-selection involved in our sampling procedures, which raises the possibility of bias. In addition, the instruments were not administered in the clinic and the instrument and interview were not contemporaneous. Thus, the performance of these short forms should be evaluated in additional types of clinics and with different research methodologies.

In spite of the differences between our two samples and the design limitations that have been mentioned, the performance of these abbreviated versions of the PCL-C remained relatively constant. This adds confidence to our conclusions about the viability of these measures. It is our hope that the development of measures such as these will increase recognition and treatment of patients with PTSD in primary care.

Acknowledgements

This study was funded in part by the NIMH grant K23 MH063152 awarded to the first author.

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