

A Brief Screening and Assessment Tool for Opioid Use in Adults: Results from a Validation Study of the Tobacco, Alcohol, Prescription Medication, and Other Substances Tool

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Objectives: This secondary analysis evaluated opioid-specific validation results of the Tobacco, Alcohol, Prescription Medication, and Other Substances (TAPS) tool for screening in primary care.

Methods: This study is a secondary data analysis of the TAPS validation study. Performance of the TAPS tool for screening for unhealthy opioid use (with a score of 1+ for heroin and/or prescription opioids representing a positive screen) was evaluated. Discriminative ability was examined in comparison with reference standard measures across the spectrum of unhealthy opioid use: timeline follow-back with and without oral fluid testing identifying past-month use and the modified Composite International Diagnostic Interview for past-year problem use, opioid use disorder (OUD), and moderate-severe OUD.

Results: In a sample of 2000 primary care patients, 114 screened positive for opioids on the TAPS tool. With a TAPS cutoff equal to 1+, the TAPS accurately identified past-month use, problem use, any OUD, and moderate-severe OUD (sensitivities = 68%–85%, specificities = 97%–98%, area under the curve = 0.80–0.91). When past-month use was expanded to include timeline follow-back with oral fluid testing,

accuracy declined (52% sensitivity [95% confidence interval, 43%–60%], 98% specific [95% confidence interval, 97%–98%]).

Conclusions: While further testing in a larger population sample may be warranted, given their brevity, simplicity, and accuracy when self-administered, the TAPS opioid items can be used in primary care settings for a spectrum of unhealthy opioid use; however, self-disclosure remains an issue in primary care settings.

Keywords: opioids, primary care, screening, validation

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More than 10 million Americans report past-year use of an opioid.¹ Unhealthy opioid use encompasses a spectrum of risk behavior, ranging from any use of an illicit opioid or non-medical use of a prescribed opioid medication, use that causes health or social problems, and opioid use disorder (OUD). Primary care settings have a key role to play in identifying and treating opioid misuse/OUD but lack opioid-specific screening tools that would allow them to quickly and accurately identify patients in need of intervention. Screeners specified for opioid use are often intended only for patients being prescribed opioids^{2,3} while commonly used illicit drug screeners are for drug use in general and do not specifically identify opioid misuse.⁴

The Tobacco, Alcohol, Prescription medication, and other Substance use (TAPS) tool was developed for substance use screening in primary care settings. The TAPS is a 2-part instrument consisting of 4-item screen for past-year use of tobacco, alcohol, illicit drugs, and nonmedical use of prescription drugs (TAPS-1), followed by a substance-specific assessment of risk level for individuals who screen positive (TAPS-2). Scoring of TAPS is substance specific based on TAPS-2 responses and ranges 0 to 3 for opioids. The accuracy of the TAPS for identifying a substance use disorder and problem use of heroin (sensitivity, 0.48–0.71) and prescription opioid (sensitivity, 0.66–0.78) independently was previously published.⁵ However, in medical settings, the priority is to identify any unhealthy opioid use. Clinicians may need to know about their patients' unhealthy opioid use even if it is not severe, to understand the level of risk, provide overdose education, and inform clinical care. We undertook a secondary analysis to evaluate the potential of the TAPS to assess for the spectrum of unhealthy opioid use: past-month use, problem use, any OUD, and moderate-severe OUD.

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METHODS

The TAPS validation study, conducted in the National Institute on Drug Abuse (NIDA) National Drug Abuse Treatment Clinical Trials Network, was a multisite study in 5 primary care clinics across 4 eastern states evaluating the performance of the TAPS tool in 2000 adult (18+) primary care patients. A validation study found the TAPS to be clinically relevant for detecting problem use and substance-specific use disorders (notably alcohol, tobacco, and cannabis) using the reference standard of the Composite International Diagnostic Interview (CIDI).⁵ In this secondary analysis, we measured diagnostic accuracy of the self-administered format of the TAPS tool for screening of unhealthy opioid use (with a score of 1+ for heroin and/or prescription opioids representing a positive screen¹) compared with reference standards. We assessed past-month use in 2 ways: as one or more days of opioid use on the 30-day Timeline Follow-back (TLFB)⁶ and with the addition of positive oral fluid result for any opioids that were not prescribed (oral fluid window 24 hours; opioids included morphine, heroin metabolite, codeine, hydrocodone, oxycodone, methadone). The modified CIDI substance use items were mapped onto the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*, OUD classifications^{5,7} and used as a reference standard^{8,9} for problem use (CIDI ≥ 1), any OUD (≥ 2), and moderate-severe OUD (≥ 4). All study procedures were approved by site institutional review boards. Sensitivity and specificity with exact 95% confidence intervals (CIs) were calculated and positive and negative diagnostic likelihood ratios with normal approximations for CIs were calculated. Analyses were performed using SAS 9.4.

RESULTS

Characteristics of the 2000 patients are presented in Table 1. Average age was 46 years, half of the sample (56%) were women, and participants were racially diverse. Past-year substance use (>0 on TAPS-1) was reported: tobacco 45.3%, alcohol 42.9%, past-year nonmedical use of prescription medications 12.2%, and illicit drugs 24.6%.

Table 2 contains opioid screening results. One hundred fourteen participants screened positive for opioids on the TAPS tool (6%). On reference standard measures, 75 (4%) reported past-month use on self-report alone and an additional 64 screened positive for past-month use when oral fluid results were also included (139 total [7%]). For detecting past-month use, against the TLFB, the TAPS had 85% sensitivity (95% CI, 77%–93%) and 97% specificity (95% CI, 97%–98%). For past-month use with oral fluid results, the TAPS was 52% sensitive (95% CI, 43%–60%) and 98% specific (95% CI, 97%–98%).

Responses on the CIDI reference standard measure identified 106 (5%) with problem use, 94 (5%) with any OUD, and 78 (4%) with moderate-severe OUD. As compared with the CIDI, the TAPS had 68% sensitivity (95% CI, 59%–77%) and

TABLE 1. Sample Characteristics (N = 2000)

	n (%)
Sex	
Male	874 (43.7)
Female	1124 (56.2)
Age, mean (SD)	46.0 (14.69)
Ethnicity	
Hispanic	233 (11.7)
Non-Hispanic	1761 (88.1)
Other/refused	6 (0.3)
Race	
American Indian or Alaska Native	12 (0.6)
Asian	35 (1.8)
Black or African American	1112 (55.6)
White	667 (33.4)
Other	69 (3.5)
Multiracial	66 (3.3)
Education level	
Less than high school	383 (19.2)
High school graduate, GED, or equivalent	578 (28.9)
Some college or higher	612 (30.6)
Substance use, endorsing >0	
TAPS-1, past-year use	
Tobacco	906 (45.30)
Alcohol	858 (42.9)
Nonmedical use of prescription medications	245 (12.2)
Illicit drugs (including cannabis)	492 (24.6)
TAPS tool ≥ 1 , current use (past 3 mo)*	
Tobacco	766 (38.3)
Alcohol	712 (35.6)
Marijuana	312 (15.6)
Stimulants (crack, cocaine, methamphetamine)	112 (5.6)
Heroin	59 (2.9)
Nonmedical use of prescription opioids	82 (4.1)
Nonmedical use of medication for anxiety or sleep	81 (4.0)
Nonmedical use of prescription stimulants	19 (1.0)
Other illicit drugs	50 (2.5)

Sex was unavailable for 2 participants, race was unavailable for 39 participants, education was missing for 1 participant, and TAPS tool scores were missing for 1 participant on tobacco, alcohol, marijuana, stimulants, heroin, and other illicit drugs.

*The TAPS tool consists of TAPS-1 followed by an assessment of current (past 3-month) use and problems related to use for each substance class (TAPS-2). In this study, all participants received the TAPS-2, regardless of their TAPS-1 responses.

GED indicates general education diploma; SD, standard deviation; TAPS, Tobacco, Alcohol, Prescription medication, and other Substance use.

98% specificity (95% CI, 97%–98%) for detecting problem use. Similarly, for detecting any OUD, the TAPS was 70% sensitive (95% CI, 61%–79%) and 97% specific (95% CI, 97%–98%). For moderate-severe OUD, the TAPS had 72% sensitivity (95% CI, 62%–82%) and 97% specificity (95% CI, 96%–98%).

DISCUSSION

At a score of 1+ for heroin and/or prescription opioids, the self-administered TAPS tool provides an effective opioid screening approach that can quickly identify patients needing further assessment to determine the level of risk and guide clinical interventions. Importantly, the ability of the TAPS tool to detect problem use as well as moderate or severe OUD could allow providers to identify patients in need of early intervention (including overdose education), as well as those for whom treatment with medications for OUD is indicated. Ultimately, decision on the next steps of assessment after a positive TAPS screening should be attuned to the goals of care within each medical setting.

¹The TAPS-2 tool items for opioid use are as follows: in the past 3 months, did you use a prescription opiate pain reliever (eg, Percocet, Vicodin) not as prescribed or that was not prescribed to you? In the past 3 months, did you use heroin? IF YES—¹ in the past 3 months, have you tried and failed to control, cut down, or stop using (heroin/an opiate pain reliever)?² In the past 3 months, has anyone expressed concern about your use of (heroin/opiate pain reliever)?

TABLE 2. Concordance Analysis for Unhealthy Opioid Use on Self-administered TAPS Tool (Past 3 mos, N = 2000)

	Past-Month Use, TLFB ≥ 1 d	Past-Month Use TLFB ≥ 1 d ± Oral Fluid*	Problem Use CIDI ≥ 1	MODERATE-SEVERE OUD CIDI ≥ 2	Moderate-Severe OUD CIDI ≥ 4
Positive on reference standard, n (%)	75 (0.04)	139 (0.07)	106 (0.05)	94 (0.05)	78 (0.04)
Positive on TAPS, n (%)	114 (0.06)	114 (0.06)	114 (0.06)	114 (0.06)	114 (0.06)
Sensitivity (95% CI)	0.85 (0.75–0.92)	0.52 (0.43–0.60)	0.68 (0.58–0.77)	0.70 (0.60–0.79)	0.72 (0.60–0.81)
Specificity (95% CI)	0.97 (0.97–0.98)	0.98 (0.97–0.98)	0.98 (0.97–0.98)	0.97 (0.97–0.98)	0.97 (0.96–0.98)
AUC	0.91	0.80	0.83	0.84	0.84
Positive likelihood ratio (95% CI)	32.85 (24.60–43.87)	22.95 (16.35–32.22)	30.5 (22.04–42.34)	27.81 (20.42–37.87)	23.73 (17.77–31.68)
Negative likelihood ratio (95% CI)	0.15 (0.09–0.26)	0.49 (0.42–0.59)	0.33 (0.25–0.43)	0.31 (0.22–0.42)	0.29 (0.20–0.41)

*Oral fluid test results do not include individuals who report being prescribed an opioid; 1802 persons provided an oral fluid sample. The TLFB measures past 30 days; The CIDI measures past 12 months.

AUC indicates area under the curve; CI, confidence interval; CIDI, Composite International Diagnostic Interview; TLFB, timeline follow-back.

While the TAPS tool performed well in comparison with self-reported measures of past-month use, sensitivity was poor when oral fluid test results were included. The limited window of oral fluid testing and small sample of persons who use opioids in this patient population should be considered. In addition, high discordance between individuals with a positive oral fluid test and negative TLFB report could be due to patient fears over disclosure,¹⁰ which may be present even when patients are assured of confidentiality. The discordance was largely driven by nonmedical use of prescription opioids (n = 64) as compared with heroin use (n = 14), a finding supported in a related study that used a smaller TLFB window.¹⁰ This may suggest that some individuals misunderstood the question about nonmedical use, or individuals who engage in nonmedical use of prescription opioids may be particularly attentive to concerns of stigma, as has been found for patients with chronic pain.¹¹ In our study, participants were assured confidentiality and anonymity. However, when screening is integrated into routine primary care, and patients are aware that their results will be seen by their physician, the purpose of the screening, consequences of a positive result, and privacy concerns must be addressed.¹²

Some limitations should be noted. The sample consisted of English-speaking patients in mainly urban areas. The validity of the tool is therefore unknown in rural primary care setting or clinics with other patient populations. Responses were subject to bias, as the TAPS tool and most of our reference standard measures rely on self-report of substance use behavior. The TLFB did not collect day of interview substance use, and this may have contributed to discordance between the TLFB and oral fluid results. Oral fluid data also suggest potential underreporting of opioid use. Finally, oral fluid findings were limited by the oral fluid detection window (up to 24 hours), potential collection or laboratory errors and other errors associated with enzyme-linked immunosorbent assay testing.

Individuals who engage in nonmedical use of prescription opioids may be reluctant to self-disclose misuse, and limitations of self-report screening tools persist even with the TAPS tool. Nonetheless, in comparison with self-reported reference standard measures, the TAPS tool has good sensitivity and specificity to

be used as a brief initial screen to identify the spectrum of unhealthy opioid use in primary care settings.

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