Performance of the Tobacco, Alcohol, Prescription Medication, and Other Substance Use (TAPS) Tool in Screening Older Adults for Unhealthy Substance Use

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Objective: This analysis evaluated the validation results of the Tobacco, Alcohol, Prescription Medication, and Other Substance Use (TAPS) tool for older adults.

Methods: We performed a subgroup analysis of older adults aged ≥65 (n = 184) from the TAPS tool validation study conducted in 5 primary care clinics. We compared the interviewer and self-administered versions of the TAPS tool at a cutoff of ≥1 for identifying problem use with a reference standard measure, the modified World Mental Health Composite International Diagnostic Interview.

Results: The mean age was 70.6 ± 5.9 years, 52.7% were female, and 49.5% were non-Hispanic Black. For identifying problem use, the self-administered TAPS tool had sensitivity of 0.91 (95% CI: 0.75–0.98) and specificity of 0.91 (95% CI: 0.85–0.95) for tobacco; sensitivity of 0.68 (95% CI: 0.45–0.86) and specificity of 0.88 (95% CI: 0.82–0.93) for alcohol; and sensitivity 0.86 (95% CI: 0.42–1.00) and specificity 0.94 (95% CI: 0.90–0.97) for cannabis. The interviewer-administered TAPS tool had similar results. We were unable to evaluate its performance for identifying problem use of individual classes of drugs other than cannabis in this population due to small sample sizes.

Conclusions: While the TAPS had excellent sensitivity and specificity for identifying tobacco use among older adults, the results for other substances lack precision, and we were unable to evaluate its performance for prescription medications and individual illicit drugs in this sample. This analysis underlines the critical need to adapt and validate screening tools for unhealthy substance use, specifically for older populations who have unique risks.

Key Words: geriatrics, substance-related disorders, mass screening, ethanol, cannabis

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The United States (US) Preventive Services Task Force recommends screening all adults for unhealthy drug and alcohol use.[1,2] Despite this, older adults are less likely to be screened for unhealthy substance use or have discussions about their use with clinicians.[3,4] Psychoactive substance use among older adults in the US increased sharply,[5,6] with the Baby Boomer generation (people born from 1946 to 1964) having higher rates of psychoactive substance use compared with any preceding generation.[3] Older individuals are more susceptible to potential harms of psychoactive substance use due to age-associated physiological changes, increases in comorbidity, and use of medications that may interact with a range of substances.

Few screening tools for unhealthy substance use have been developed specifically for older adults, and existing tools are limited to unhealthy alcohol use and are challenging to use in clinical settings given their length.[3] It is unclear how more widely used screening tools perform in older populations. The Tobacco, Alcohol, Prescription Medication, and Other Substance Use (TAPS) tool is a validated screening and brief assessment instrument for detecting clinically relevant problematic substance use among adults in primary care settings.[7] The TAPS tool was not developed for older adults, and while the validation study included older adults, it is unclear how it performs specifically in this population. We conducted a secondary analysis to evaluate the performance of TAPS in identifying unhealthy substance use among older adults.

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METHODS

The TAPS tool is a 2-part instrument consisting of a 4-item screen for past-year (12-month) use of tobacco, alcohol, illicit drugs, and nonmedical use of prescription drugs (TAPS-1), followed by a substance-specific risk level assessment for each screened positive substance (TAPS-2). The 4-item TAPS-1 asks about use of tobacco, alcohol above guideline-recommended daily limits (>5 drinks/day for men, >4 drinks/day for women), and illicit drugs. Participants choose from 5 response options ranging from 'never' to 'daily or almost daily.' Any response other than 'never' constitutes a positive screen and is followed by a substance-specific risk level assessment (TAPS-2).[7] The TAPS-2 evaluates use in the past 3 months of tobacco, alcohol, illicit drugs (including cannabis, cocaine, or methamphetamine), heroin, and other drugs (including hallucinogens, ecstasy/3,4-methylenedioxymethamphetamine) and nonmedical use of 3 classes of psychoactive prescription medications (sedatives, opioids, and stimulants) via a yes/no format. When the answer is 'yes' to any use, the individual receives 2–3 follow-up items specific to that substance class, and responses are summed within each substance class to generate a substance-specific risk score (0–3 for tobacco and other drugs, and 0–4 for alcohol), with an optimal cutoff score of ≥2 for identifying high risk use. The TAPS tool can be administered face-to-face or self-administered on a tablet to accommodate a range of clinical workflows.

The TAPS validation study was conducted by the National Institute on Drug Abuse's Clinical Trials Network. It was a multisite study conducted at 5 primary care clinics in 4 eastern states evaluating the performance of the TAPS tool in 2000 adult primary care patients. The validation study found the TAPS tool performed well for detecting clinically relevant problem use, with the modified World Health Organization World Mental Health Composite International Diagnostic Interview (hereafter called the CIDI) as the reference standard.[7] In this secondary analysis, we measured the diagnostic accuracy of both the interviewer and self-administered versions of the TAPS tool at a cutoff of ≥1 for identifying problem use among the subgroup of older adults from the validation study. Sensitivity and specificity were calculated with 95% confidence intervals (CIs) and positive and negative diagnostic likelihood ratios with normal approximations for CIs. Analyses were performed using Stata 17SE.[8] For individual drug types, we were unable to evaluate its performance for identifying problem use other than cannabis due to small sample sizes. Nonmedical use of prescription opioids, sedatives, and stimulants could not be assessed given zero "true positives."

RESULTS

Among the 2000 adults in the validation study, 184 were age ≥65 and included in the analysis. The mean age of the 184 adults was 70.6 ± 5.9 years (range: 65–94). Among the sample, 52.7% were female, 49.5% identified as Black, and 9.8% identified as Hispanic. For identifying problem use utilizing the cutoff of ≥1, the self-administered TAPS tool (n=184) had a sensitivity of 0.91 (95% CI: 0.75–0.98) and a specificity of 0.91 (95% CI: 0.85–0.95) for tobacco; a sensitivity of 0.68 (95% CI: 0.45–0.86) and a specificity 0.88 (95% CI: 0.82–0.93) for alcohol; and a sensitivity of 0.86 (95% CI: 0.42–1.00) and a specificity of 0.94 (95% CI: 0.90–0.97) for cannabis (Table 1). For identifying problem use, the interview-administered TAPS tool (n=183) had a sensitivity of 0.81 (95% CI: 0.64–0.93) and a specificity of 0.89 (95% CI: 0.83–0.93) for tobacco; a sensitivity of 0.64 (95% CI: 0.41–0.83) and a specificity of 0.88 (95% CI: 0.82–0.93) for alcohol; and a sensitivity of 1.00 (95% CI: 0.59–1.00) and a specificity of 0.92 (95% CI: 0.87–0.96) for cannabis.

DISCUSSION

This secondary subgroup analysis of the TAPS validation study demonstrates that while the TAPS tool had excellent sensitivity and specificity for identifying problem tobacco use, the results for other substances lack precision, with wide CIs for

TABLE 1. Diagnostic Accuracy of the Interviewer-Administered TAPS Tool for Identifying Unhealthy Use among Older Adults

Self-administered (n=184)	True (+) (n)	False (+) (n)	False (−) (n)	True (−) (n)	Sensitivity (95% CI)	Specificity (95% CI)	Positive Likelihood Ratio (95% CI)	Negative Likelihood Ratio (95% CI)
Tobacco	29	14	3	138	0.91 (0.75–0.98)	0.91 (0.85–0.95)	9.84 (5.90–16.41)	0.10 (0.04–0.30)
Alcohol*	15	19	7	143	0.68 (0.45–0.86)	0.88 (0.82–0.93)	5.81 (3.49–9.68)	0.36 (0.20–0.67)
Cannabis	6	10	1	167	0.86 (0.42–1.00)	0.94 (0.90–0.97)	15.17 (7.73–29.76)	0.15 (0.02–0.93)
Illicit drugs† (including cannabis)	10	13	2	159	0.83 (0.52–0.98)	0.92 (0.87–0.96)	11.03 (6.17–19.71)	0.18 (0.05–0.64)
Illicit drugs (not including cannabis)	5	8	1	170	0.83 (0.36–1.00)	0.96 (0.91–0.98)	18.54 (8.62–39.88)	0.17 (0.03–1.04)
Interviewer-Administered (n=183)	**True (+) (n)**	**False (+) (n)**	**False (−) (n)**	**True (−) (n)**	**Sensitivity (95% CI)**	**Specificity (95% CI)**	**Positive Likelihood Ratio (95% CI)**	**Negative Likelihood Ratio (95% CI)**
Tobacco	26	17	6	134	0.81 (0.64–0.93)	0.89 (0.83–0.93)	7.22 (4.48–11.64)	0.21 (0.10–0.44)
Alcohol*	14	19	8	142	0.64 (0.41–0.83)	0.88 (0.82–0.93)	5.39 (3.18–9.14)	0.41 (0.24–0.72)
Cannabis	7	14	0	162	1.00 (0.59–1.00)	0.92 (0.87–0.96)	12.57 (7.61–20.78)	0.00
Illicit drugs† (including cannabis)	11	16	1	155	0.92 (0.62–1.00)	0.91 (0.85–0.95)	9.80 (5.96–16.10)	0.09 (0.01–0.60)
Illicit drugs (not including cannabis)	4	7	2	170	0.67 (0.22–0.96)	0.96 (0.92–0.98)	16.86 (6.71–42.32)	0.35 (0.11–1.08)

*TAPS-1 screening cutoff >5 drinks/day for men, >4 drinks/day for women.

†Includes cannabis, cocaine or crack, heroin, methamphetamine, hallucinogens, ecstasy/3,4-methylenedioxymethamphetamine.

CI indicates confidence interval; TAPS, Tobacco, Alcohol, Prescription Medication, and Other Substance Use.

sensitivity estimates. False-positive results occurred frequently, which could be an issue for clinical practices caring for patients with multiple chronic diseases. Furthermore, the small sample sizes for prescription medications and illicit drugs other than cannabis prohibited evaluating the tool's performance for these substances.

The TAPS validation study was not powered to evaluate its performance in older populations, so further validation studies should be considered for older adults, especially in geriatric medicine clinics. Increasing the sample size of older adults may provide more precise estimates and allow for evaluation of the tool's performance for prescription medications and individual illicit drugs. However, the TAPS tool may need to be adapted specifically for older populations, given their higher risk for adverse effects related to substance use. For example, due to the physiological changes related to aging, older adults are more likely to have higher blood alcohol concentrations compared with younger adults who consume the same amount of alcohol.[3] Therefore, the screening cutoff for unhealthy alcohol use should be lowered for this population. Furthermore, the "reference standard" CIDI criteria comparison used for the validation study may not be appropriate for older adults, given their increased sensitivity to psychoactive substances and lower tolerance. Grouping cannabis with "illicit" drugs also may no longer be appropriate, given the changing legal landscape and increasing use for medical purposes, particularly in older adults.[5,9] For this population, a dedicated and validated screening question focused on cannabis may be needed. Finally, given the potential increased risk for interactions of substances with medications and chronic conditions in older adults, an adapted screening tool should consider incorporating an assessment of these interactions into the TAPS tool scoring, similar to what has been done in the Comorbidity Alcohol Risk Evaluation Tool.[10]

A patient-centered screening strategy must be developed to quickly and effectively identify unhealthy substance use and address a major evidence gap in screening to reduce the harms related to psychoactive substance use among older adults who are increasingly using these substances. Current tools that screen for unhealthy use of multiple substances, including the TAPS, need to be adapted and evaluated for older adults.

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