



# Tobacco Treatment Knowledge and Practices Among US Psychiatrists

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## Abstract

This study explores the extent to which psychiatrists are familiar with, and utilize, the USPHS guidelines for treating tobacco use and dependence (i.e., the 5A's), deliver cessation treatment, and the barriers they perceive to doing so. An original, national survey of 141 psychiatrists revealed that most Ask patients if they smoke (81.6%). Fewer Advise them to stop (78.7%) and Assess their willingness to quit (73.6%). A minority Assist with a quit plan (15.9%) and Arrange for follow-up (26.4%). Just 11.9% have used the USPHS guidelines in clinical practice; 37% have never heard of them. Even among those who say they have used the USPHS guidelines, implementation of the 5A's is quite low. Time-related factors were the most common barriers to cessation delivery (51.4%). Patient factors (30%) and financial/resource factors (25%) were less common. There is a strong need for increased implementation of clinical guidelines for evidence-based tobacco treatments among psychiatrists.

**Keywords** Tobacco use disorder · Treatment guidelines · Awareness · Implementation

## Introduction

Cigarette smoking remains the leading cause of preventable disease and death in the United States (Cornelius et al., 2020; Stanton et al., 2016). The US Public Health Service (USPHS) “Clinical Practice Guideline for Treating Tobacco Use and Dependence,” recommends physicians implement the 5A's with patients who smoke—“Ask” about tobacco use, “Advise” to quit, “Assess” willingness to quit, “Assist” with a quit attempt, and “Arrange” follow-up (Fiore et al., 2008). Moreover, in 2015, the American Psychiatric Association issued a position paper on Tobacco Use Disorder urging psychiatrists to adopt this approach (APA Workgroup on Tobacco Use Disorder Council on Addiction Psychiatry, 2015). Table 1 describes each of the 5A's in greater detail.

Studies exploring the implementation of the 5A's by various specialties have documented historically high rates of “Ask” and “Advise” (Quinn et al., 2005; Schaer et al., 2021), with lower rates of “Assess,” “Assist,” and “Arrange” (Chase et al., 2007; Park et al., 2015; Schaer et al., 2021).

Notably lacking from the literature on the implementation of the 5A's is data on psychiatrists. Psychiatrists are particularly critical in the treatment of tobacco use given that individuals with mental health diagnoses use tobacco at far higher rates (Rogers & Wysota, 2019; Stanton et al., 2016). Moreover, psychiatrists are trained to use pharmacological and non-pharmacological modalities to treat addiction and are thus well poised to address tobacco use. However, some data suggest they are the least likely physicians to utilize these treatments (Rogers & Wysota, 2019; Steinberg et al., 2006). This national survey explores the implementation of the 5A's among psychiatrists.

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## Methods

This study was part of a national repeated, cross-sectional physician survey on tobacco treatment which targeted multiple specialties. We briefly summarize our study methods here; details for the overall study are found elsewhere (Schaer et al., 2021). A sample of 500 psychiatrists was

**Table 1** The “5 A’s” model for treating tobacco use and dependence

|   |  |
|---|--|
| Ask about tobacco use                     | Identify and document tobacco use status for every patient at every visit  |
| Advise to quit                            | In a clear, strong, and personalized manner, urge every tobacco user to quit   |
| Assess willingness to make a quit attempt | Is the tobacco user willing to make a quit attempt at this time?   |
| Assist in quit attempt                    | For the patient willing to make a quit attempt, offer medication and provide or refer for counseling or additional treatment to help the patient quit<br>For patients unwilling to quit at the time, provide interventions designed to increase future quit attempts     |
| Arrange followup                          | For the patient willing to make a quit attempt, arrange for followup contacts, beginning within the first week after the quit date<br>For patients unwilling to make a quit attempt at the time, address tobacco dependence and willingness to quit at next clinic visit |

Reproduced from *Treating tobacco use and dependence: 2008 update—clinical practice guideline* (Fiore et al., 2008)

randomly drawn from the American Medical Association’s Physician Masterfile. Survey fielding occurred from May to July 2021. Sampled psychiatrists were mailed an invitation letter that contained an incentive and a link to complete the survey anonymously online. Three follow-up reminders were sent for a total of four mailings. While 210 psychiatrists initially participated, 69 respondents were ineligible because they were not seeing outpatients, resulting in 141 eligible participants. This yielded an AAPOR Response Rate 3 of 42% (American Association for Public Opinion Research, 2011). Respondents were asked to indicate how often they engage in each of the 5A’s in their outpatient practice. With the exception of Assist, each activity was assessed with one item. “Assisting” was operationalized as responding “always” or “most of the time” to each of the following: encouraging smokers to set a quit date, discussing medication options, and referring to treatment. Barriers to providing smoking cessation treatment were assessed using a four-point scale. Respondents also indicated how effective they thought each of seven FDA-approved medications were in smoking cessation via a four-point scale (not at all effective to very effective). Analyses were conducted using SPSS version 27. Univariate descriptive statistics describe the sample in detail as well as the variables of interest. Additionally, we employed cross-tabulations to explore the relationship between psychiatrists’ characteristics and their experience with, and implementation of, the USPHS guidelines. Consistent with previous work, we report physician-perceived barriers individually and grouped into three categories: time factors, patient factors, and financial/resource factors. All participants provided informed consent, and the Rutgers Institutional Review Board approved the study procedures. All authors declare no known conflicts of interest and certify responsibility for the manuscript.

**Table 2** Characteristics of psychiatrist respondents

| Characteristic                  | Total N = 141 |      |
|---------------------------------|---------------|------|
|                                 | N             | %    |
| Age, mean, years (SD)           | 56.0          | 10.8 |
| Sex                             |               |      |
| Male                            | 80            | 56.7 |
| Female                          | 49            | 34.8 |
| No response                     | 12            | 8.5  |
| Race/Ethnicity                  |               |      |
| White, non-Hispanic             | 93            | 66   |
| Asian, Pacific Islander         | 12            | 8.5  |
| South Asian                     | 8             | 5.7  |
| Black, non-Hispanic             | 5             | 3.5  |
| Hispanic                        | 4             | 2.8  |
| No response/other               | 19            | 13.5 |
| Medical school                  |               |      |
| U.S. graduate                   | 109           | 77.3 |
| Graduation year                 |               |      |
| Before 1990                     | 57            | 40.4 |
| During 1990s                    | 34            | 24.1 |
| During 2000s                    | 36            | 25.5 |
| No response                     | 14            | 9.9  |
| Practice type                   |               |      |
| Group-single specialty          | 23            | 16.3 |
| Hospital or health organization | 38            | 27   |
| Mutlispecialty                  | 5             | 3.5  |
| Solo practice                   | 39            | 27.7 |
| Academic medical center         | 13            | 9.2  |
| Federal or state agency         | 14            | 9.9  |
| Other                           | 5             | 3.5  |
| No response                     | 4             | 2.8  |

## Results

Table 2 summarizes the demographic and professional characteristics of the respondents. The mean age was 56.0 years. A majority were male (56.7%) and identified as white, non-Hispanic (66%). A plurality graduated medical school before 1990 (40.4%) and 77.3% graduated from a US medical school.

Figure 1 displays delivery of each of the 5A's. Ask and Advise were most common (81.6% and 78.7%, respectively), though Assess was a close third (73.6%). Psychiatrists engaged in Assisting (15.9%) and Arranging (26.4%), at far lower rates.

Tobacco treatment related knowledge and beliefs appear in Table 3. A small minority (11.9%) reported using the USPHS Guidelines, and 37% had never heard of them. The most common barriers were time related (51.4%). Psychiatrists also pointed to patient factors, with 30% strongly agreeing that patients' disinterest in pharmacotherapy and/or resistance to cessation messages were barriers. Financial or resource barriers were cited slightly less frequently.

A majority of respondents rated most of the FDA approved pharmacotherapies as "very" or "somewhat" effective. Large majorities said this about varenicline (89.7%) and the nicotine patch (77.5%), bupropion (73.7%), and nicotine gum (70.5%), while smaller majorities perceived nicotine lozenges (60.3%), nicotine oral inhalers (57.1%) and nicotine nasal spray (52.3%) as effective.

There was no relationship between psychiatrists' demographic and work-related characteristics and whether they have heard of, read, or used the USPHS guidelines (see Table 4). When it comes to implementation of each of the 5A's, a greater proportion of non-white psychiatrists indicated they Assess patients' willingness to quit (57% vs.

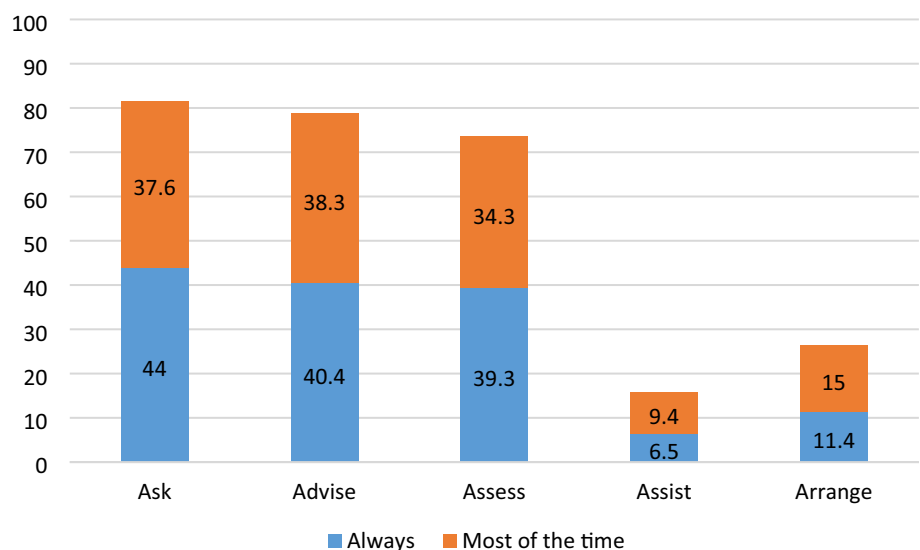
**Table 3** Tobacco treatment-related knowledge and beliefs among U.S. psychiatrists

| Beliefs/awareness   | Total N = 141 <sup>a</sup> |      |
|---|----------------------------|------|
|   | N                          | %    |
| Awareness of USPHS guidelines   |                            |      |
| Never heard about   | 50                         | 37   |
| Heard/read about but not used   | 69                         | 51.1 |
| Have used in practice   | 16                         | 11.9 |
| Barriers to cessation delivery (SA)                                   |                            |      |
| Lack of training  | 10                         | 7.1  |
| Time factors  |                            |      |
| Competing priorities in the visit                                     | 70                         | 50   |
| Lack of time during patient visit                                     | 25                         | 17.7 |
| Patient factors   |                            |      |
| Patients' disinterest in pharmacotherapy                              | 19                         | 13.6 |
| Patient's resistance to cessation messages                            | 34                         | 24.3 |
| Financial/resource factors  |                            |      |
| Lack of community resources for referral                              | 23                         | 16.4 |
| Cost of cessation treatment to patient (e.g., medication, counseling) | 15                         | 10.7 |
| No or limited provider reimbursement                                  | 10                         | 7.1  |
| Perceived effectiveness of pharmacotherapy (SW/V effec)               |                            |      |
| Varenicline (Chantix)   | 122                        | 89.7 |
| Nicotine patch  | 107                        | 77.5 |
| Bupropion (Zyban)   | 101                        | 73.7 |
| Nicotine gum  | 98                         | 70.5 |
| Nicotine lozenge  | 82                         | 60.3 |
| Nicotine oral inhaler   | 64                         | 57.1 |
| Nicotine nasal spray  | 57                         | 52.3 |

SA strongly agree; SW/V effec somewhat/very effective

<sup>a</sup>Not all percentages based on N = 141 due to item non-response

**Fig. 1** Psychiatrists and the 5A's



**Table 4** Physician characteristics by study outcomes

| Sex  | Race  |           | Graduated med school |             | Time factors are barriers |     |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
|--|-------|-----------|----------------------|-------------|---------------------------|-----|-----|-----|----------------|--------------------|----------------|------|----|-----|----|-----|--------------|-----|--------------|-----|-----|-----------------|
|  | White | Non-white | After 1999           | During 90 s | Before 1990               | P   |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| Male   | n     | n         | n                    | n           | n                         | n   |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| %  | %     | %         | %                    | %           | %                         | %   |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| Female   | n     | n         | n                    | n           | n                         | n   |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| %  | %     | %         | %                    | %           | %                         | %   |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| P  | P     | P         | P                    | P           | P                         | P   |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| <b>Experience w guidelines</b>                 |       |           |                      |             |                           |     |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| Never heard of                                 | 25    | 32%       | 21                   | 43%         | 0.495                     | 35  | 38% | 10  | 29%            | 0.67               | 17             | 49%  | 11 | 32% | 17 | 30% | 0.363        | 19  | 29%          | 31  | 44% | 0.195           |
| Heard of, not read                             | 41    | 52%       | 17                   | 35%         | 40                        | 43% | 18  | 51% | 15             | 43%                | 15             | 44%  | 29 | 44% | 29 | 52% | 30           | 46% | 30           | 43% |     |                 |
| Read, not used                                 | 5     | 6%        | 4                    | 8%          | 9                         | 10% | 0   | 0%  | 0              | 0%                 | 3              | 9%   | 5  | 9%  | 5  | 9%  | 6            | 9%  | 3            | 4%  |     |                 |
| Used   | 8     | 10%       | 7                    | 14%         | 8                         | 9%  | 7   | 20% | 3              | 9%                 | 5              | 15%  | 5  | 15% | 5  | 9%  | 10           | 15% | 6            | 9%  |     |                 |
| <b>Implementation of 5A's</b>                  |       |           |                      |             |                           |     |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| Ask  | 35    | 44%       | 24                   | 49%         | 0.324                     | 43  | 46% | 15  | 43%            | 0.732              | 11             | 31%  | 15 | 44% | 31 | 54% | 0.079        | 37  | 54%          | 25  | 35% | <b>0.019</b>    |
| Advise   | 34    | 43%       | 18                   | 37%         | 0.807                     | 36  | 39% | 15  | 43%            | 0.669              | 12             | 33%  | 11 | 32% | 28 | 49% | 0.177        | 33  | 49%          | 24  | 33% | 0.067           |
| Assess   | 38    | 48%       | 17                   | 35%         | 0.057                     | 34  | 37% | 20  | 57%            | <b>0.036</b>       | 15             | 43%  | 10 | 29% | 27 | 47% | 0.237        | 41  | 60%          | 22  | 31% | <b>&lt;.001</b> |
| Assist   | 15    | 19%       | 5                    | 10%         | 0.446                     | 10  | 11% | 10  | 29%            | <b>0.014</b>       | 2              | 6%   | 6  | 18% | 11 | 19% | 0.186        | 17  | 25%          | 5   | 7%  | <b>0.004</b>    |
| Arrange  | 24    | 30%       | 10                   | 20%         | 0.486                     | 27  | 29% | 6   | 17%            | 0.17               | 7              | 20%  | 5  | 15% | 22 | 39% | <b>0.025</b> | 23  | 34%          | 14  | 19% | 0.054           |
| <b>Patient factors are barriers</b>            |       |           |                      |             |                           |     |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| <b>Financial/resource factors are barriers</b> |       |           |                      |             |                           |     |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| No   | Yes   | P         | No                   | Yes         | P                         | No  | Yes | P   | Never heard of | Heard of, not read | Read, not used | Used | P  |     |    |     |              |     |              |     |     |                 |
| n  | n     | %         | n                    | n           | %                         | n   | n   | %   | n              | n                  | n              | n    | %  |     |    |     |              |     |              |     |     |                 |
| %  | %     |           | %                    | %           |                           | %   | %   |     | %              | %                  | %              | %    |    |     |    |     |              |     |              |     |     |                 |
| <b>Experience w guidelines</b>                 |       |           |                      |             |                           |     |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| Never heard of                                 | 41    | 43%       | 9                    | 23%         | 0.131                     | 36  | 35% | 14  | 42%            | 0.602              | 16             | 32%  | 33 | 55% | 2  | 22% | 8            | 50% | <b>0.049</b> |     |     |                 |
| Heard of, not read                             | 38    | 40%       | 22                   | 55%         | 47                        | 46% | 13  | 39% | 10             | 20%                | 32             | 53%  | 3  | 33% | 8  | 50% | <b>0.003</b> |     |              |     |     |                 |
| Read, not used                                 | 5     | 5%        | 4                    | 10%         | 8                         | 8%  | 1   | 3%  | 18             | 36%                | 26             | 43%  | 4  | 44% | 10 | 63% | 0.322        |     |              |     |     |                 |
| Used   | 11    | 12%       | 5                    | 13%         | 11                        | 11% | 5   | 15% | 1              | 2%                 | 12             | 20%  | 1  | 13% | 5  | 31% | <b>0.009</b> |     |              |     |     |                 |
| <b>Implementation of 5A's</b>                  |       |           |                      |             |                           |     |     |     |                |                    |                |      |    |     |    |     |              |     |              |     |     |                 |
| Ask  | 42    | 43%       | 20                   | 48%         | 0.603                     | 47  | 45% | 15  | 43%            | 0.844              | 16             | 32%  | 33 | 55% | 2  | 22% | 8            | 50% | <b>0.049</b> |     |     |                 |
| Advise   | 34    | 35%       | 23                   | 55%         | <b>0.027</b>              | 43  | 41% | 14  | 40%            | 0.921              | 10             | 20%  | 32 | 53% | 3  | 33% | 8            | 50% | <b>0.003</b> |     |     |                 |
| Assess   | 41    | 42%       | 22                   | 52%         | 0.25                      | 47  | 45% | 16  | 46%            | 0.922              | 18             | 36%  | 26 | 43% | 4  | 44% | 10           | 63% | 0.322        |     |     |                 |
| Assist   | 14    | 14%       | 8                    | 20%         | 0.441                     | 16  | 15% | 6   | 17%            | 0.805              | 1              | 2%   | 12 | 20% | 1  | 13% | 5            | 31% | <b>0.009</b> |     |     |                 |
| Arrange  | 26    | 27%       | 11                   | 26%         | 0.967                     | 26  | 25% | 11  | 31%            | 0.439              | 8              | 16%  | 19 | 32% | 1  | 11% | 7            | 44% | 0.064        |     |     |                 |

Bold values indicate statistical significance (P < .05)

37%,  $P = .036$ ) and Assist them in doing so (29% vs. 11%,  $P = .014$ ) compared to their white counterparts. Psychiatrists in practice the longest were most likely to say they Arrange for followup, with 39% that graduated medical school before 1990 doing so, and 15% and 20% of those that graduated during the 1990s and 2000s, respectively, saying they do ( $P = .025$ ).

Certain barriers that psychiatrists perceive to providing cessation treatment are related to which of the 5A's they implement. Significantly lower percentages of respondents that pointed to time-related barriers, like competing priorities and insufficient time during visits, Ask (35% vs. 54%,  $P = .019$ ), Assess (31% vs. 60%,  $P < .001$ ), and Assist (7% vs. 25%,  $P = .004$ ). On the other hand, a higher percentage of psychiatrists that endorsed patient-related barriers, such as disinterest in pharmacotherapy and resistance to cessation messages, Advise their patients to quit (55% vs 35%,  $P = .027$ ).

Finally, psychiatrists' experience with the USPHS guidelines is related to their implementation of the 5A's. Interestingly, the highest percentages of psychiatrists that Ask (55%) and Advise (53%) are among those who say they have heard of the guidelines but not read them ( $P = .049$  and  $.003$ , respectively). Meanwhile, respondents who indicated using the guidelines were most likely to say they Assit (31%,  $P = .009$ ).

## Discussion

While the role of psychiatrists in tobacco treatment has been discussed for decades (Tamerin & Eisinger, 1972), this study appears to be the first national survey of psychiatrists focused on engagement in the 5A's. Although these findings are consistent with other surveys indicating that physicians often Ask and Advise patients (Goldstein et al., 1998; Schaer et al., 2021; Solberg et al., 2005), psychiatrists do so at a notably lower rate. This is despite additional training in addiction treatment, having a much higher proportion of their patients use tobacco, higher perceived efficacy of tobacco treatment medications, and lower perceived barriers for tobacco treatment. Others have noted similar trends among psychiatrists, and that screening rates may be worsening over the years (Rogers & Sherman, 2014).

Comparatively, psychiatrists in this survey reported Asking and Advising at lower rates than nearly all internists, family physicians, cardiologists and pulmonologists in our national study (Schaer et al., 2021). This is similar to previous findings that suggest that although psychiatrists are most likely to have larger proportions of patients who currently smoke in their care (Centers for Disease Control and Prevention, (CDC), 2005), they are less likely to participate in most smoking cessation activities (Cohen et al., 2007).

Psychiatrists do, however, report following up at a similar or in some cases higher frequency than these other specialties. The nature of psychiatric practice may allow psychiatric providers to engage in better structured follow up routines than their colleagues in some other specialties. If so, this presents an opportunity for more sustained engagement in cessation treatment delivery in the future.

Previous research has also shown that less than one-in-five physicians across a variety of specialties utilize the USPHS guidelines (Schaer et al., 2021). At just under 12%, the rate of psychiatrists using these guidelines is also quite low. However, while nearly one-third of physicians in other specialties say that lack of time during a patient visit is a barrier to delivering cessation treatment (Schaer et al., 2021), only 18% of psychiatrists say the same. Psychiatrists also perceive less patient resistance to cessation messaging (24% vs. 32% in other specialties) and lower financial barriers for their patients (11% vs. 18% in other specialties). Furthermore, a higher percentage of psychiatrists perceive various forms of FDA approved pharmacotherapy as effective than their counterparts in other specialties. While a majority of psychiatrists perceive all such pharmacotherapy as effective, ranging from a low of 52.3% for nicotine nasal spray to a high of 89.7% for varenicline, only three of those medications (varenicline, bupropion, and the nicotine patch) were perceived as effective by a majority of physicians in other specialties in our national study (Schaer et al., 2021). In short, given fewer perceived barriers reported by psychiatrists, one would expect higher, rather than lower, rates of treatment delivery among this group compared to those in other specialties.

Our survey suggests that half of psychiatrists see “competing priorities” as a barrier to delivering the 5A's, suggesting we must make efforts to bring implementation of the 5A's by psychiatrists up to levels of other physicians. One approach may be to further explore exactly what psychiatrists mean when they report that competing priorities are a barrier. Our data do not allow us to further delve into their meaning. However, given that psychiatrists reported fewer barriers than other specialties, they could be suggesting that addressing tobacco is simply not a priority *for them*. Indeed, (Williams et al., 2020) found that almost two-thirds of psychiatry residents did not see addressing tobacco—even among those who were motivated to quit—as part of a psychiatrists' role. Depending upon the meaning of “competing priorities,” increasing implementation may require additional continuing education regarding the desire of patients to address their tobacco use. As we note above, 30% of our respondents reported that their patients were uninterested in pharmacotherapy or cessation in general. However, previous data suggest that individuals with mental health concerns are, in fact, interested in quitting smoking (Petroulia et al., 2019; Young-Wolff et al., 2014). Additionally, system-level

changes such as modifications to electronic health records or formal relationships with outside cessation services may be warranted.

Finally, it is worth noting that the largest share of psychiatrists that Ask their patients about tobacco use and Advise those who use to quit was among those who say they have heard of the USPHS guidelines but never read them. While it is encouraging that some psychiatrists who are unfamiliar with the 5A's are nevertheless still implementing some of them, it is concerning that among those who say they have used the guidelines, half do not Ask or Advise, roughly four-in-ten do not Assess, seven-in-ten do not Assist, and more than half do not Arrange.

This study has a few limitations. First, data are self-reported and delivery of the 5A's was assessed from a physician's perspective. Second, engagement in the 5A's was not time bound (e.g., in past year). Third, the survey did not assess use of Electronic Health Records (EHRs), which are less likely to be used by psychiatrists than by other medical specialties (Busch et al., 2018) and may be associated with improved use of the 5 A's (Mahabee-Gittens et al., 2018). Fourth, while the national sample is a strength, the response rate for psychiatrists is lower than our other specialities (Schaer et al., 2021). While respondents did not differ from non-respondents in terms of age or gender, non-respondents may differ from participating physicians in other ways. Given that survey topic salience is a strong predictor of participation, our findings may represent an upper bound for the delivery of the 5A's. Finally, we urge caution in interpreting some of the crosstabulation results (Table 4) based on small cell sizes.

## Conclusion

Psychiatrists' addiction training and frequent exposure to patients who smoke, along with confidence in pharmacotherapy and lower perceived barriers should result in high treatment engagement but, as shown in this study, disappointingly do not. Increasing uptake of the 5A's by psychiatrists requires a multifaceted approach, which includes continuing education, addressing physician's perceived barriers, and system changes (Brown et al., 2015). Finally, it is noteworthy that tobacco use disorder is listed in the DSM-5, just like generalized anxiety disorder, opioid use disorder, and other diagnoses regularly addressed by psychiatrists. It is reasonable to expect psychiatrists to address tobacco use disorder with a similar level of commitment.

**Author Contributions** BS had full access to study data and takes responsibility for the integrity of the data. WJY takes responsibility for the accuracy of the data analyses. Concept and design: CDD, MBS.

Acquisition, analysis, or interpretation of data: All authors. Drafting of the manuscript: WJY, MBS, CDD. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: WJY. Obtained funding: CDD, MBS. Administrative, technical, or material support: BS. Supervision: CDD.

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**Data Availability** Data may be requested from Cristine Delnevo (ORCID 0000-0001-9597-4307) and should include a plan for its use. Data will be available to qualified researchers after the main findings are published in a peer-reviewed journal. All data sharing will comply with local, state, and federal laws and regulations and may be subject to appropriate human subjects institutional review board approvals.

## Declarations

**Conflict of interest** None reported.

**Ethical Approval** The Rutgers Institutional Review Board approved study procedures. Study conducted in accordance with the 1964 Declaration of Helsinki.

**Consent to Participate** Informed consent was obtained from all individual participants included in the study.

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