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ADHD Screening and Follow-Up: *Results from a Survey of Participants 2 Years after an Adult ADHD Screening Day*

Lenard A. Adler, MD, Michael Ciranni, MD, PhD, David M. Shaw, BA, and Pooja Paunikar, MPH

ABSTRACT

Background: *This study evaluated participants 2 years after they had screened positive on the Adult ADHD Self-Report Scale version 1.1 (ASRS v 1.1) Screener for attention-deficit hyperactivity disorder (ADHD) at a screening day event to assess their clinical course in terms of a formal ADHD diagnosis and treatment.*

Methods: *Fifty-one of the 228 participants who initially screened positive and consented to future contact for research were randomly selected to participate in a telephone survey.*

Results: *Only 20 of the 41 participants with no prior ADHD diagnosis followed up to seek a formal diagnosis. ADHD was diagnosed in 90% of those who followed up. Between those who did and did not seek an ADHD diagnosis, there were no differences in the amount of contact with primary care and mental health providers.*

Discussion: *The ASRS v1.1 Screener was effective at identifying individuals at high risk; however, <50% of at-risk individuals followed up for diagnosis. The amount of contact with the healthcare system was comparable between those who did and those who did not seek an ADHD diagnosis, but this regular contact with medical and mental health professionals did not lead to diagnosis and treatment of their symptoms.*

Conclusion: *While screening for adult ADHD can identify adults who might have ADHD, screening alone is not sufficient to ensure subsequent evaluation and treatment. Regular contact with healthcare professionals also does not guarantee that individuals at risk for ADHD will be identified, indicating the need for additional follow-up for individuals who screen positive.*

FOCUS POINTS

- Community surveys have shown that attention-deficit/hyperactivity disorder (ADHD) is underdiagnosed and undertreated.
- Regular contact with healthcare professionals alone does not ensure that adults with ADHD will be diagnosed.
- Less than 50% of the adults who screened positive at a public ADHD screening event followed up for diagnosis.
- Adults who screen positive for ADHD need closer follow-up to make sure their symptoms are evaluated and treated.

INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a chronic neuropsychiatric disorder characterized by an inability to sustain attention and/or regulate motor behavior/impulsivity.[1] This condition persists into adulthood for approximately two out of three children,[2] leading to problems in adult daily life with work, interpersonal relationships, substance abuse, and driving.[3]

Despite growing recognition, adult ADHD remains under-diagnosed and under-treated.[4] Previous estimates have suggested that as many as 8 million adults in the United States have ADHD.[3] A 2005 prescription data-

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base survey[5] found that roughly 1.5 million adults in the US were receiving medication for ADHD, implying that only one in four adults with the disorder are being treated. Similarly, the National Comorbidity Survey Replication (NCS-R), a community-based survey, found a prevalence of ADHD of 4.4% among adults in its sample.[6] However, only 10% of those respondents in the NCS-R who met criteria for ADHD reported receiving treatment for ADHD in the previous year, and >40% of those respondents reported they had not been previously diagnosed despite seeing a health-care professional in the previous year.[6]

The authors of this article have been interested in this disparity between the prevalence of adult ADHD as noted by systematic surveys and the number of adults receiving appropriate treatment. The authors conducted the New York University (NYU) School of Medicine Adult ADHD Screening Day to improve public awareness of adult ADHD. Individuals taking part in Screening Day received free, confidential adult ADHD screenings with clinicians available to discuss the screening results and provide referrals for treatment. Approximately 2 years after Screening Day, the authors conducted a follow-up survey with individuals who screened positive for ADHD to assess their clinical course in terms of a formal ADHD diagnosis and treatment.

METHODS

ADHD Screening Day

The NYU School of Medicine Adult ADHD Screening Day was a 1-day program conducted at a midtown Manhattan hotel. Clinicians from the Adult ADHD Research Program at the NYU School of Medicine, as well as representatives from the support group Children and Adults with ADHD (CHADD), held information sessions about ADHD in adults. Attendees were then invited to take a confidential screening survey for ADHD. Recruitment was conducted through local newspapers, radio stations, television, and word-of-mouth. The conduct of the study was approved by the NYU School of Medicine Institutional Review Board.

ADHD Screening Survey

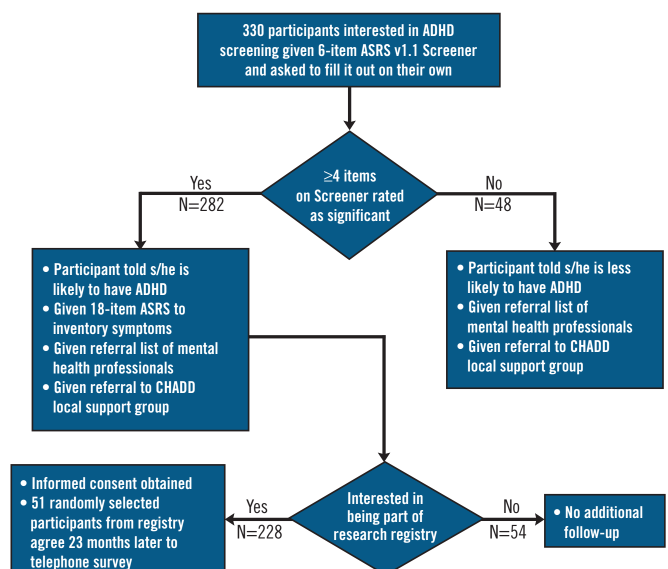
Consenting individuals were screened for ADHD with the Adult ADHD Self-Report Scale version 1.1 (ASRS v1.1) Screener.[7] The ASRS Screener is derived from the World Health Organization's (WHO) 18-question ASRS v1.1 Symptom Checklist. It is composed of the six symptoms of ADHD psychometrically determined to be most predictive of the disorder with a positive predictive value between 57% and 93%.[7,8] The scale has been validated and has a wide acceptance to identify adults who might have ADHD. The ASRS v1.1 Screener is in the public domain and is copyrighted by the WHO. It is downloadable from the WHO Web site and also from the NYU Adult ADHD Program Web site.[9]

Selection of Participants for ADHD Screening Day Follow-Up Survey

The procedure for screening individuals at ADHD Screening Day and selection of participants for the follow-up survey is shown in Figure 1. Figure 2 shows the distribution of Screening Day attendees at each stage of this selection process. Of the 440 individuals that attended Screening Day, 330 consented to take part in the screening survey. All consenting participants were given the ASRS v1.1 Screener as well as referrals to mental health professionals and the CHADD local support group. Participants that screened positive (≥4 of 6 items rated as significant on the ASRS v1.l Screener) for ADHD were told by Screening Day clinicians that they were likely to have ADHD and given the full 18-item inventory from the ASRS v1.1 Symptom Checklist. In addition, they were asked if they were interested in being part of a follow-up survey. Two hundred eighty-two participants (85% of the screening sample) screened positive for ADHD; 228 of these indi-

FIGURE 1

ADHD SCREENING DAY PROCEDURES AND SELECTION OF PARTICIPANTS FOR FOLLOW-UP SURVEY



ASRS v1.1=Adult ADHD Self-Report Scale-Version 1.1; CHADD=Children and Adults with ADHD.

Adler LA, Ciranni M, Shaw D, Paunikar P. *Primary Psychiatry*. Vol 17, No 2. 2010.

viduals who screened positive gave signed written consent to be contacted for the follow-up survey.

ADHD Screening Day Follow-up Survey

Fifty-one individuals who consented to be contacted again were randomly selected and agreed to participate in the ADHD Screening Day Follow-Up Survey. The Follow-up Survey was conducted via a 20-minute telephone interview starting in April 2006, 23 months after Adult ADHD Screening Day. The survey consisted of 32 questions that covered the following topics: demographic information, education, and employment; their subsequent course of treatment for ADHD after screening positive, including whether and how an ADHD diagnosis was made and what treatment was provided; other psychiatric comorbidities and treatment; substance use history; contact with other medical professionals; and driving history.

TABLE 1

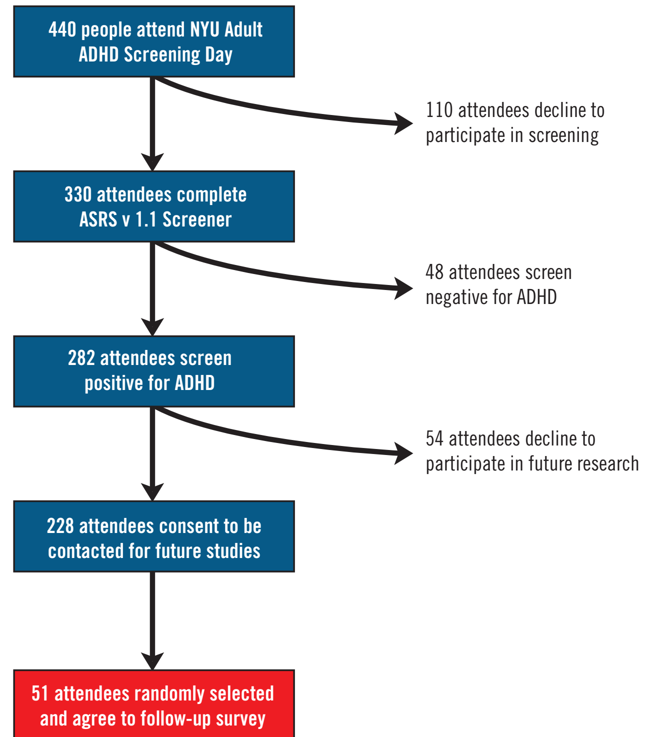
DEMOGRAPHICS

Mean Age (SD, years)	53 (13.6)
Ethnicity n (%)	
Caucasian	42 (82.4)
African American	5 (9.8)
White Hispanic	2 (3.9)
Black Hispanic	1 (1.9)
Asian American	0 (0.0)
Other/refused to answer	1 (1.9)
Gender n (% Male)	29 (56.9)
Marital Status n (%)	
Single	17 (33.3)
Married/domestic partners	23 (45.1)
Separated	1 (1.9)
Divorced	7 (13.7)
Widowed	3 (5.9)
Education n (%)	
Up to 9th Grade	1 (1.9)
Graduated high school or equivalent	4 (7.8)
Partial college	8 (15.7)
Graduated 2-year or 4-year college	27 (52.9)
Completed graduate school	11 (21.6)
Repeated a grade	10 (19.6)
Employment n (%)	
Employed	34 (66.7)
Student	3 (5.9)
Retired	11 (21.6)
Unemployed	2 (3.9)
Disability	1 (1.9)
Mean Number of Job Changes (SD)	6.7 (6.8)

Adler LA, Ciranni M, Shaw D, Paunikar P. *Primary Psychiatry*. Vol 17, No 2. 2010.

FIGURE 2

SELECTION OF PARTICIPANTS FOR RESEARCH



NYU=New York University; ASRS v1.1=Adult ADHD Self-Report Scale-Version 1.1.

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TABLE 2

MOTOR VEHICLE DRIVING HISTORY

Automobile Accidents	
Has been involved in an automobile accident n (%)	39 (76.5)
Mean lifetime number of automobile accidents (SD)	2.7 (0.6)
Mean number of automobile accidents in past year (SD)	0.1 (0.05)
Speeding Violations	
Has received a speeding ticket n (%)	31 (60.8)
Mean lifetime number of speeding tickets (SD)	1.8 (0.4)
Mean number of speeding tickets in past year (SD)	0.14 (0.08)
Other Moving Violations	
Has received a moving violation n (%)	24 (47.1)
Mean lifetime number of moving violations (SD)	1.1 (0.3)
Mean number of moving violations in past year (SD)	0.14 (0.06)

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RESULTS

Demographics of Survey Respondents

Table 1 shows the demographic information for the 51 respondents in the authors' survey. In terms of education, fifty respondents (98%) had completed high school, thirty-eight (75%) had completed college, and eleven (22%) had a graduate degree. Despite these educational achievements, 10 respondents (20%) also reported being held back a grade in school. Thirty-four respondents (67%) reported being currently employed. Three (6%) were students, 11 (22%) were retired, two (4%) were unemployed, and one (2%) was on disability. The respondents who were currently employed reported that they had changed jobs seven times on average since finishing school.

Forty-six (90%) respondents reported seeing a mental health provider at some point in the past. Twenty-four (47%) had received a psychiatric diagnosis other than ADHD (eg, major depressive disorder, generalized anxiety disorder) and 23 (45%) reported taking medication for this condition. Thirty-three respondents (65%) had used alcohol in the past year. Among those drinking ethanol, the average number of drinks per week was 7.6±13.0. Two (4%) respondents reported drinking five or more drinks in a single episode. Nineteen respondents (37%) admitted to using illicit drugs in the past, but only four respondents (8%) reported using illicit drugs in the past 12 months.

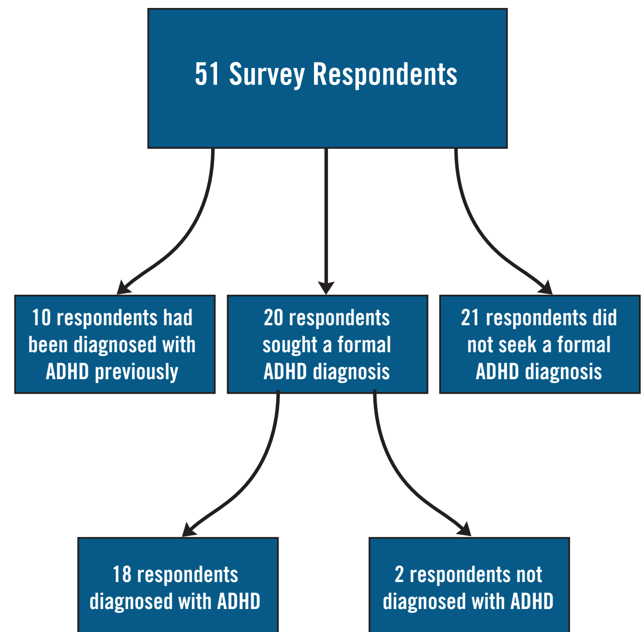
Survey respondents' driving history is displayed in Table 2. Thirty-nine respondents (76%) reported being involved in at least one accident in their lifetime, with a lifetime average of 2.7±0.6, and 0.1±0.05 accidents in the past year. Thirty-one respondents (61%) reported receiving at least one speeding ticket in their lifetime, with a lifetime average of 1.8±0.4, and 0.14±0.08 speeding tickets in the past year. Twenty-four respondents (47%) reported receiving at least one moving violation in their lifetime, with a lifetime average of 1.1±0.3, and 0.14±0.06 moving violation in the past year.

Follow-up of Positive Screens for ADHD

The distribution of survey respondents with respect to a formal ADHD diagnosis is shown in Figure 3. Ten respondents (20%) reported that they had received a diagnosis of ADHD prior to Screening Day. Only 20 of the remaining 41 respondents (49%) followed up on their positive screen for ADHD to confirm the diagnosis. For the 41 respondents with no prior diagnosis of ADHD, there were no significant differences between respondents who did seek an ADHD diagnosis and those who did not in terms of frequency of contact with medical or mental health professionals, or in terms of other psychiatric diagnoses treated with medication. (Table 3).

FIGURE 3

DISTRIBUTION OF SURVEY RESPONDENTS WITH RESPECT TO ADHD DIAGNOSIS



Adler LA, Ciranni M, Shaw D, Paunikar P. *Primary Psychiatry.* Vol 17, No 2. 2010.

TABLE 3

COMPARISON OF CONTACT WITH AND TREATMENT BY HEALTH PROFESSIONALS BETWEEN THOSE WHO DID AND DID NOT SEEK A DIAGNOSIS OF ADHD

	Sought ADHD Diagnosis (n=20)	*Did Not Seek ADHD Diagnosis (n=21)*	χ^2
Saw primary care physician within the last 12 months	18	19	0.003
Saw mental health professional within the last 12 months	20	16	0.352
Saw mental health professional more than once a month	10	13	0.589
Diagnosed with other mental health disorder	10	7	1.172

Adler LA, Ciranni M, Shaw D, Paunikar P. *Primary Psychiatry.* Vol 17, No 2. 2010.

ADHD was diagnosed in 18 of the 20 respondents (90%) who sought a formal diagnosis. The diagnosis was made by a specialist for 17 of those 18 respondents (94%). Among those 18 respondents diagnosed with ADHD, 16 (89%) received medication, and seven (39%) received non-medication treatments such as counseling or life coaching.

DISCUSSION

The follow-up survey provides further data that the ASRS v1.1 Screener is effective in identifying adults at risk for ADHD, as 90% of those with no prior diagnosis who followed up on their screening results were diagnosed with ADHD. In nearly all cases, this diagnosis was made by a specialist instead of a primary care physician (PCP). This finding is consistent with other research suggesting that PCPs receive less training and are less comfortable diagnosing and treating ADHD.[10]

Less than 50% of those with no prior ADHD diagnosis but who screened positive actually followed up to seek a formal diagnosis. These results are comparable to the NCS-R survey in which slightly >50% of that sample who met criteria for ADHD reported being diagnosed with the condition in the past year. The authors' observed follow-up rate for ADHD symptoms is markedly lower than the 75% follow-up rate reported for patients who screened positive for depression in a primary care setting.[11] In a regression model of factors predicting follow-up after a positive screen for depression, higher levels of education and prior visits to a mental health specialist were both predictive of increased rates of follow-up from a positive depression screen.[11] The large majority of survey respondents in the current study were highly educated and had previously seen a mental health provider; thus, if these factors for depression screening follow-up also apply to follow-up from ADHD screening, then the observed rate of follow-up for the sample may overestimate the expected follow-up rate in the general population. The follow-up rate in this study also appears lower than the follow-up rates reported after screening for other medical conditions, including a >80% follow-up rate when recommended after mammography screening,[12] and a >67% follow-up rate for people found to have elevated cholesterol after screening.[13]

Survey respondents overall appeared well-connected with healthcare providers, and the amount of contact with the healthcare system was comparable between those who did and those who did not seek an ADHD diagnosis. Nonetheless, contact with the healthcare system does not appear sufficient to ensure diagnosis and treatment of ADHD: if patients do not discuss these symptoms with healthcare providers, clinicians will not necessarily screen patients for these symptoms. Survey respondents informally reported a variety of reasons for not following up on their positive screens, most often that their ADHD symptoms kept them from following up appropriately, and wished that a follow-up appointment could have been given at ADHD Screening Day.

The high rates of psychiatric comorbidity reported by the study sample are consistent with the results of the National Comorbidity Survey Replication,[6] which found rates of comorbid depression and anxiety among those with ADHD to be 2–3 times as high as for those without ADHD. While some researchers have found higher rates of substance abuse among people with ADHD,[3] the prevalence of illicit substance use in the authors' sample, over the lifetime and in the past year, was lower than the 45.4% lifetime prevalence and 14.5% past 12-month prevalence of illicit substance use reported in 2006 for the National Survey on Drug Use and Health.[14] The lower prevalence in the sample may reflect a selection bias of participants motivated to attend Screening Day and consent to future research, and/or reluctance to discuss past or current illicit drug use via telephone interview. The average number of automobile accidents over the past year for the sample was approximately three times higher than the average number of accidents over the year 2006 for the population of licensed drivers in New York State,[15] which is consistent with previous reports of adolescents with untreated ADHD having three times as many accidents as those without the disorder.[3]

This study has several limitations. This was an enriched sample; Screening Day attendees had an 85% screen positive rate for ADHD, far higher than would be expected for the general population. Survey respondents were drawn from a pool of individuals motivated enough to attend ADHD Screening Day and to consent to future contact about ADHD research studies. As noted earlier, the results from this educated, motivated sample who was already well-connected with the healthcare system may overestimate the likelihood in the general community of people following up from a positive screen. Reliance on respondents' retrospective self-reports may have introduced several reporting biases. Nonetheless, the results are consistent with other reports demonstrating a lack of treatment for adults likely to have ADHD, and this deficit persists despite adequate contact with medical and mental healthcare professionals.

CONCLUSION

Screening for adult ADHD can identify adults at risk for ADHD; however, many adults who screen positive do not follow up for diagnosis and treatment. Regular contact with medical and mental health professionals does not in itself guarantee that adults with undiagnosed ADHD will be identified and treated. Adults who appear at risk for ADHD need more active follow-up to ensure that they receive appropriate care. ***PP***

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