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Pediatric Primary Care Provider Practices, Knowledge and Attitudes of HIV Screening Among Adolescents

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Abstract

Objectives—To evaluate pediatric primary care provider (PCP) HIV screening practices, knowledge, and attitudes.

Study design—Anonymous cross-sectional, internet-based survey of pediatric PCPs from 29 primary care practices. Survey items assessed current HIV screening practices and knowledge, attitudes, and perceived barriers towards screening. Provider demographics and practice characteristics were analyzed for associations with screening through logistic regression.

Results—Of 190 PCPs, there were 101 evaluable responses (response rate: 53.2%). PCPs reported a screening rate for HIV of 39.6% (“most” or “all of the time”) during routine adolescent visits compared with violence (60.4%), substance abuse (92.1%), and depression (94.1%) ($p < 0.001$). Less than 10% of PCPs correctly answered questions related to CDC and state HIV screening recommendations. Of 20 potential HIV screening barriers assessed, mean number of reported barriers was 4.8 (SD $\pm$ 2.9); with most concerns related to confidentiality, time for counseling, and follow up. In a multivariable model, the only factor significantly associated with HIV screening “most” or “all of the time” during routine adolescent visits was urban practice site (adjusted odds ratio 9.8, 95% CI 2.9, 32.9). Provider type, sex, years since training, HIV screening guideline knowledge, and endorsing 5 barriers were not associated with HIV screening.

Conclusions—Although providers practicing in urban areas were more likely to report screening adolescents for HIV than those in suburban areas, overall self-reported screening rates were low, and several barriers were identified commonly. Future interventions should target increasing providers' knowledge and addressing concerns about confidentiality, requirements and counseling time, and follow-up of results.

Although adolescents and young adults comprise less than 25% of the United States population, almost 40% of all new human immunodeficiency virus (HIV) infections were

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diagnosed among this age group in 2009.(1) Furthermore, an estimated 21% of HIV-infected individuals in the United States are unaware of their HIV status,(2) and many others are diagnosed late in infection.(3, 4) In response to the growing incidence of HIV among this population, the Centers for Disease Control and Prevention (CDC) published revised recommendations in 2006, advocating that all individuals 13–64 years of age be offered routine opt-out HIV screening in all health care settings, regardless of perceived risk.(5) Similarly, the American Academy of Pediatrics (AAP) has also recently advocated for increasing the pediatrician's role in promoting routine HIV screening, recommending testing all adolescents at least once by the age of 16–18, irrespective of reported sexual activity.(6) Similarly, the US Preventive Services Task Force (USPSTF) recently released a recommendation for routine HIV screening among all adolescents and adults aged 15–65 years.(7)

Despite recommendations for routine HIV screening, testing rates remain low. Recent data from the Youth Risk Behavior Survey revealed that although almost 50% of high school students reported being sexually experienced, just 22.6% of sexually active high school students reported being tested for HIV.(8) Given the high level of HIV risk among adolescents and current recommendations for routine screening, it is unclear why such few youth are being tested as part of primary care health supervision.(9)

The objectives of our study were to evaluate primary care provider (PCP) HIV screening practices, knowledge of screening guidelines, and attitudes toward adolescent HIV screening in the primary care setting. To our knowledge, this is the first study to evaluate adolescent HIV screening among pediatric PCPs in diverse primary care practice settings.

METHODS

This was an anonymous cross-sectional survey of pediatric PCPs from 29 practice sites in a primary care network (comprised of 5 academic primary care centers and 22 community-based primary care offices) affiliated with the Children's Hospital of Philadelphia, a large free-standing academic children's hospital. Practitioners within each primary care site were eligible for participation if they evaluated adolescents (age >13 years) in their practice and were attending-level physicians or nurse practitioners. There were no specific exclusion criteria for this study. The study was granted exemption from formal review by our institutional review board.

Survey Development and Administration

Initial survey items were developed and adapted by the investigative team after comprehensive literature review of prior HIV testing and screening surveys.(10–12) Survey validation methods included initial pilot testing, and content validation using a panel of HIV experts from adolescent medicine, infectious diseases, and general pediatrics. The study was administered in April 2012 using the Research Electronic Data Capture (REDCap) software, an institutionally-supported, secure, web-based survey administration and data management application. Potential subjects were recruited over a 1-month period via an electronic-mail invitation with weekly reminders for non-respondents. Consent for participation was implied through initiation and completion of the survey. Study subjects were presented with 59 multiple choice and Likert-scale questions examining the following domains: HIV screening practices, knowledge of HIV screening guidelines ($\alpha=0.56$), barriers and potential facilitators of HIV screening in the primary care setting ($\alpha=0.87$), and provider demographic and practice characteristics. The low reliability of the first scale and the early stage of the instrument development led to report of data from individual items instead of scale scores. State laws regarding consent and counseling requirements for the two states where providers practiced were reviewed and noted.(13)

Statistical Analyses

Subjects answering less than 90% of questions were considered as voluntary withdrawals, and were excluded from the final analysis. Analyses included investigation of current HIV screening practices, knowledge of HIV testing indications, barriers and facilitators to testing, and investigation of an association of provider and practice characteristics with screening patterns.

Data were summarized using standard descriptive statistics: continuous variables were summarized using means and standard deviations and categorical variables were summarized using frequencies and proportions. Comparisons of categorical variables of interest were accomplished using the chi-square test. Univariate logistic regression was performed to identify factors associated with reported HIV screening practices. Multivariate logistic regression was then performed to identify factors independently associated with reported HIV screening practices. All variables with a p-value <0.1 on univariate logistic regression were retained in our multivariate model. Furthermore, correlation testing was performed to assess for collinearity among the independent variables included in the multivariate regression analysis. Univariate and multivariate associations were reported with odds ratios (OR) and 95% confidence intervals (CI) where appropriate. All analyses were conducted using Stata 12.0 (College Station, TX).

RESULTS

Of the 190 pediatric PCPs who met inclusion criteria, there were 103 responses, with 101 (53.2%) evaluable responses. The characteristics of the survey responders are shown in Table I. There were no differences between responders and non-responders with regards to provider type or sex; although suburban PCPs were less likely to respond compared with urban PCPs ($p=0.004$).

We surveyed participants with respect to screening for several common adolescent health risks “most of the time” or “all of the time”. The percentage of pediatric PCPs who reported screening “most of the time” or “all of the time” for HIV was 39.6% (95% CI 30.2, 49.8); in comparison, screening was higher for other adolescent health risks, including violence (60.4%; 95% CI 51.2, 70.8), substance abuse (92.1%; 95% CI 87.6, 98.4), and depression (94.1%; 95% CI 90.3, 99.7) ($p<0.001$).

Table II reviews knowledge assessment of the CDC HIV screening recommendations and related state laws. 10% (95% CI 4.1, 16.0) of respondents correctly answered all knowledge assessment questions of CDC and state HIV screening recommendations. Only 44% (95% CI 34.1, 53.9) correctly responded that written consent for HIV screening was not required by state law. Participants who answered at least half of the knowledge questions correctly (35.6%; 95% CI 26.4, 45.6) were more likely to work in urban practice sites (OR 3.33, 95% CI 1.41, 7.86). There was no difference in knowledge of CDC and state HIV screening recommendations by provider type ($p=0.47$), sex ($p=0.68$), or years since training ($p=0.44$). Survey participants were also asked about types of HIV screening methods available at their practice sites. Point-of-care rapid testing was reported to be available by 13.9% of respondents; serum HIV antibody test by 43.6%; serum combined HIV antibody and p24 antigen test by 34.6%; and 12.9% of respondents stated that they did not know.” Additionally, over one quarter (28.7%; $n=29$) of participants reported that their clinic did not offer HIV screening, despite confirmation that all sites did indeed have HIV testing capability. Providers at suburban practice sites were more likely to report that their clinic did not offer HIV screening than providers at urban practices (OR 56.0; 95% CI 7.2, 436.7). Participants were also asked to estimate the prevalence of HIV among their clinic population. Suburban providers (73%) compared with urban providers (10.4%) were more

likely to believe that their local HIV seroprevalence rate was $<0.1\%$ (OR 23.3, 95% CI 7.7, 70.9) when in fact, all the counties where both the urban and suburban practices are located have a seroprevalence of $>0.1\%$.

Table III lists provider responses for HIV screening frequency based on types of patient encounters. Nearly all providers reported that they always provide HIV screening to adolescents if they request an HIV test (92.9%); however, only 11% reported always providing HIV screening to all adolescents, regardless of risk. The majority of participants agreed or strongly agreed with CDC recommendations for HIV screening (56.4%; 95% CI 47.1, 66.9) and with the AAP HIV screening recommendations (80.2%; 95% CI 73.0, 89.0).

Of 20 potential HIV screening barriers assessed, the mean number of reported barriers to HIV screening was 4.8 (standard deviation ± 2.9). The most common barriers reported were related to confidentiality and concerns about having ample time for test counseling and follow up of results (Table IV). Participants who reported at least 5 barriers to HIV screening were more likely to be male (OR 2.7, 95% CI 1.1, 7.1) and to practice in a suburban setting (OR 8.0, 95% CI 3.0, 21.1). There was no statistically significant relationship between reporting at least 5 barriers and provider type. Furthermore, half of the respondents (51%; 95% CI 41.0, 61.1) affirmed that they intend to increase offering routine HIV screening to adolescent patients regardless of risk.

Facilitators identified for adoption of routine testing into practice included the following: availability of appropriate patient education materials related to HIV (77%); staff training and on-call support for HIV testing (73%); information about state and local consent laws (71%); information about where to refer patients with high-risk behaviors (69%); information about which HIV tests are available and when and how to order the appropriate test (62%); training in how to conduct confidential sexual health assessment and education discussions with patients (56%); consultation regarding how to incorporate routine testing into practice flow (56%).

In univariate analysis, female providers were more likely to screen for HIV “most” or “all of the time” compared with male providers (OR 6.2, 95% CI 1.7, 22.7) as were providers who had completed training within the last 10 years (OR 2.7, 95% CI 1.1, 7.0). Furthermore, providers from urban practice sites were more likely to report HIV screening “most” or “all of the time” than suburban practices (OR 14.1, 95% CI 5.2, 38.6). There was no difference in reported HIV screening practices by provider type ($p=0.82$). Additionally, there was no difference in reported HIV screening practices by provider knowledge of the CDC HIV screening recommendations ($p=0.25$). However, participants who agreed or strongly agreed with HIV screening recommendations from the CDC (OR 3.1; 95% CI 1.3, 7.3) were more likely to report screening for HIV “most” or “all of the time”. Additionally, report of fewer than 5 barriers was associated with increased likelihood to report screening for HIV “most” or “all of the time” during a routine adolescent health supervision visit (OR 8.2, 95% CI 2.8, 23.9).

In multivariate analysis, the only factor independently associated with HIV screening “most” or “all of the time” during routine adolescent visits was urban practice site (OR 9.8, 95% CI 2.9, 32.9). Provider’s sex, years since training completion, reported agreement with CDC screening recommendations, and endorsing 5 barriers were not associated with HIV screening practices.

DISCUSSION

Although both the AAP(6) and the CDC(5) recommend routine HIV screening for adolescents, we found that many primary care providers infrequently screen for HIV. This

finding suggests that few adolescents are receiving recommended care from pediatric PCPs with regards to HIV screening. This is unfortunate, as adolescents often cite not being offered HIV testing as one of the principal reasons for not having been tested.(14–16) Furthermore, adolescents are more likely to agree to be tested if recommended by a physician.(17) Our findings of self-reported low HIV screening frequency among pediatric PCPs are consistent with similar surveys that have explored HIV screening practices of other internal medicine and family practice PCPs.(10, 12, 18)

Our results also demonstrate that providers are still using a targeted approach to HIV screening despite recommendations for routine and universal screening. The majority of providers reported screening for HIV at patient request or clinical suspicion, after sexual assault, or if presenting with STI related symptoms; yet very few providers reported providing HIV screening to all adolescents, regardless of risk. Other recent studies have also documented continued risk-based HIV screening practices in other settings despite emerging evidence and consensus recommendations in support of routine testing.(18–20)

Unfortunately, we also found that pediatric PCPs have poor knowledge of the CDC recommendations and related state laws for HIV screening. Only 10% of respondents answered all of the knowledge assessment questions correctly and only 35% accurately answered at least half of the knowledge assessment questions. Also, it is important to note that nearly 75% of providers in suburban settings underestimated the seroprevalence of HIV in their communities. Our results contrast with a previous survey of various primary care specialties, including Family Medicine, Internal Medicine, Pediatrics, Obstetrics and Gynecology, which found that almost 50% of survey respondents correctly responded to knowledge items regarding CDC recommendations and almost two-thirds demonstrated knowledge of state consent laws.(12) However, similar to our study, they too found low rates of HIV screening practices among providers,(12) reinforcing our finding that simply having knowledge of the HIV screening guidelines is insufficient to drive increased HIV screening practices among providers.

In our study, the most common barrier reported was difficulty in discretely screening adolescents when accompanied by their parents or guardians. This finding suggests that many pediatricians may not be conducting confidential interviews with their adolescent patients, despite professional society recommendations and adolescents' legal right to confidential healthcare related to testing and treatment for sexually transmitted infections and HIV.(21) Concerns about confidentiality represent an important barrier specific to pediatric providers for implementation of routine HIV screening among adolescents. This is contrast to studies of adult providers where lack of time and perceived patient reluctance or refusal are the most commonly reported barriers.(10)

Unlike prior studies,(22, 23) we found no differences in HIV screening practices by provider's sex or time since training completion; the only factor associated with HIV screening was an urban practice setting. Our new finding that pediatric PCPs in suburban practice settings are less likely to routinely screen for HIV further suggests that these providers are continuing to offer screening based on perceived or reported risk despite evidence and recommendations to the contrary.(5, 24)

This study has several potential limitations. Given that not all providers eligible for the study completed the survey, this study may be prone to response bias. However, our response rate of 53.2% was higher than other studies surveying physician practices of HIV screening.(10, 18, 25, 26) Furthermore, non-responders were similar to responders with respect to provider type and sex, although non-responders were more likely to practice in suburban areas. Another limitation of this study is that we surveyed providers affiliated with one pediatric

primary care network. Therefore, our results may not be generalizable to other geographic areas. However, the unique strength of using a large pediatric primary care network is that it is comprised of diverse practice characteristics with regards to staffing (teaching versus community), location (urban versus suburban) and patient population. Finally, the instrument used is in early stage of development and needs further evaluation in the future. Studies that address validity, especially factor structure, and internal reliability, especially the low reliability of the knowledge of HIV screening guidelines scale, are needed.

Pediatric PCPs report poor knowledge of HIV screening recommendations and are infrequently screening adolescent patients. Fortunately, many pediatric PCPs expressed intention to screen more frequently, which may be a positive predictor of future provider behavior change. Further studies should be conducted to confirm our findings and to develop and test interventions to improve screening rates by addressing specific barriers including confidentiality concerns related to communication with adolescent patients and families as well as billing, knowledge of local seroprevalence and legal requirements, and comfort with brief counseling and delivery of results.

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List of Abbreviations

PCPs	Primary care providers
HIV	Human Immunodeficiency Virus
CDC	Centers for Disease Control and Prevention
AAP	American Academy of Pediatrics
OR	Odds ratios
CI	95% confidence intervals

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Table I

Demographic Comparison of Survey Responders versus Non-Responders

Demographic		Responder (n=101) n, (%)	Non-Responder (n=88) n, (%)	p-value
Provider Type	Attending Physician	90 (89.1)	78 (88.6)	p=.92
	Nurse Practitioner	11 (10.9)	10 (11.4)	
Sex *	Male	22 (23.7)	21 (23.9)	p=.97
	Female	71 (76.3)	67 (76.1)	
Race/Ethnicity	Non-Hispanic White	78 (83.0)	-	n/a
	Non Hispanic Black/African American	5 (5.3)	-	
	Hispanic or Latino	3 (3.2)	-	
	Other	8 (8.5)	-	
Years Since Training Completion [^]	Within last 10 years	24 (27.0)	-	n/a
	11–20 years	36 (40.4)	-	
	>21 years	29 (32.6)	-	
Practice Type [#]	Urban	48 (48.0)	24 (27.3)	p=.004
	Suburban	52 (52.0)	64 (72.7)	

* n=93 for Responders

[^] n=89 for Responders[#] n=100 for Responders

Table 2

Knowledge Assessment of CDC HIV Screening Recommendations and Related State Laws

Recommendations (n=102)		N (%)
Screening for all patients 13 and over	Yes *	40 (39.6%)
	No	23 (22.8%)
	Do not know	38 (37.6%)
Written consent required	Yes	39 (38.6%)
	No ^{*^}	44 (43.6%)
	Do not know	18 (17.8%)
Only individuals at increased risk should be screened (n=100)	Yes	28 (28.0%)
	No *	51 (51.0%)
	Do not know	21 (21.0%)
How often is screening recommended for high risk patients?	At least every 3 months	25 (24.8%)
	At least annually *	56 (55.4%)
	At least every 2 years	1 (1.0%)
	I do not know	19 (18.8%)

* Correct answer

[^] Both Pennsylvania and NJ do not require written consent for HIV screening

Table 3

Reported HIV Screening Frequency by Visit Type and Clinical Presentation:

HIV Screening frequency during:		None of the time	Some of the time	Half of the time	Most of the time	All of the time
Visit Type	Acute care visits (n=100)	39 (39.0%)	51 (51.0%)	5 (5.0%)	4 (4.0%)	1 (1.0%)
	Routine visits (n=99)	22 (22.2%)	34 (34.3%)	6 (6.1%)	24 (24.2%)	13 (13.1%)
	New patient visits (n=99)	29 (29.3%)	35 (35.4%)	6 (6.1%)	16 (16.2%)	13 (13.1%)
Clinical Presentation	All adolescents, regardless of risk (n=99)	40 (40.4%)	30 (30.3%)	6 (6.1%)	12 (12.1%)	11 (11.1%)
	Patient requested HIV test (n=99)	2 (2.0%)	1 (1.0%)	0 (0%)	4 (4.0%)	92 (92.9%)
	Suggestive symptoms of STI (n=100)	4 (4.0)	8 (8.0%)	4 (4.0%)	23 (23.0%)	61 (61.0%)
	Clinical suspicion of HIV or AIDS (n=100)	1 (1.0%)	1 (1.0%)	0 (0%)	6 (6.0%)	92 (92.0%)
	Suspected sexual assault (n=97)	4 (4.1%)	2 (2.1%)	1 (1.0%)	8 (8.3%)	82 (84.5%)
	Reported recent unprotected sex (n=99)	6 (6.1%)	18 (18.2%)	4 (4.0%)	18 (18.2%)	53 (53.5%)

Table 4

Cited Barriers to HIV Screening:

Most Commonly Cited Barriers	% Agreed/Strongly Agreed
It is difficult to discretely screen adolescents for HIV when accompanied by their parents or guardians.	71
Pre-test counseling significantly lengthens the time required to screen for HIV.	51
I feel uncomfortable offering HIV screening to my adolescent patients because I'm concerned about maintaining confidentiality when billing for the service.	49
It is difficult to ensure appropriate follow-up to provide patients with their HIV test results.	48
Post-test counseling significantly lengthens the time required to screen for HIV, irrespective of the test results.	44
Least Commonly Cited Barriers	
I feel uncomfortable screening for HIV in adolescents due to my religious, spiritual or cultural beliefs.	0
I am hesitant to screen for HIV because a positive HIV test result would require too much time for me to address in an office visit.	3
I believe consent from a parent/guardian should be obtained prior to screening for HIV in an adolescent.	4
I am uncomfortable discussing high-risk behaviors with my patients.	4
Lack of or low reimbursement for HIV testing prevents me from screening my patients.	4