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Primary Care Providers' Awareness of Physical Activity-Related Intensive Behavioral Counseling Services for Cardiovascular Disease Prevention

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Abstract

Purpose: The US Preventive Services Task Force recommends that adults at risk for cardiovascular disease (CVD) be offered or referred to intensive behavioral counseling interventions to promote a healthful diet and physical activity for CVD prevention. We assessed primary care providers' (PCPs) awareness of local physical activity-related behavioral counseling services, whether this awareness was associated with referring eligible patients, and the types and locations of services to which they referred.

Design: Cross-sectional survey.

Setting: Primary care providers practicing in the United States.

Subjects: 1256 respondents.

Measures: DocStyles 2016 survey assessing PCPs' awareness of and referral to physical activity-related behavioral counseling services.

Analysis: Calculated prevalence and adjusted odds ratios (aORs).

Results: Overall, 49.9% of PCPs were aware of local services. Only 12.6% referred many or most of their at-risk patients and referral was associated with awareness of local services (aOR = 2.81, [95% confidence interval: 1.85-4.25]). Among those referring patients, services ranged from a health-care worker within their practice or group (25.4%) to an organized program in a medical facility (41.2%). Primary care providers most often referred to services located outside their practice or group (58.1%).

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Author's Note

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Conclusion: About half of PCPs were aware of local behavioral counseling services, and referral was associated with awareness. Establishing local resources and improving PCPs' awareness of them, especially using community–clinical linkages, may help promote physical activity among adults at risk for CVD.

Keywords

counseling; primary health care; physical activity; cardiovascular disease

Purpose

Physical inactivity is an important modifiable risk factor for cardiovascular disease (CVD), which is the leading cause of death in the United States.¹ Primary care providers (PCPs) can play an important role in helping patients increase their physical activity through behavioral counseling.^{2–4} The US Preventive Services Task Force (USPSTF) recommends that adults who are overweight or have obesity and have additional CVD risk factors be offered or referred to intensive behavioral counseling interventions to promote a healthful diet and physical activity for CVD prevention.⁴ Over 1 in 3 US adults is eligible for intensive behavioral counseling, and almost 1 in 5 US adults is both eligible and does not participate in enough aerobic physical activity to meet the current guideline.^{5, 6}

Despite the evidence supporting behavioral counseling interventions and their potential for population health impact, they are not routinely offered due to issues including lack of time, resources, reimbursement, and knowledge.^{7, 8} Beyond these barriers, ensuring that local behavioral counseling resources exist and that PCPs are aware of them is also potentially important to facilitate referrals to these services. However, research on the degree to which PCPs' awareness of local services influences referrals to them is needed to help better understand the mechanisms influencing this referral process and identify opportunities to improve PCP referral practices for this high-risk population.

In addition, to our knowledge, no studies have examined the services PCPs currently refer to for physical activity counseling and whether they are located in community or health-care settings. Two established delivery models for behavioral counseling include referral from the primary care setting to an external program or service, or to services within the health-care setting; some behavioral counseling interventions are more effective if delivered in a community setting.⁷ For referral to external services, one way to potentially facilitate the process is through community–clinical linkages.^{7, 9–13} Understanding where PCPs currently refer their patients at risk for CVD for physical activity behavioral counseling can provide a useful assessment of current practices and inform future strategies to create or improve community–clinical linkages.

This study aimed to determine the proportion of PCPs aware of local physical activity-related intensive behavioral counseling services, whether this awareness was associated with referring eligible patients, and the types and locations of services to which they referred.

Methods

Design

This cross-sectional study used data from DocStyles 2016, a Web-based panel survey conducted by Porter Novelli Public Services from June to July 2016. Porter Novelli Public Services is a public relations firm that has a specialty practice in health and social marketing (<http://www.porternovelli.com>). The DocStyles survey was designed to provide insight into health-care providers' attitudes and counseling behaviors with regard to a variety of health issues.

Sample

The sample was drawn from SERMO's Global Medical Panel.¹⁴ Panelists are recruited via by telephone or face-to-face via calling lists of hospitals and physicians or via online Web registration and are verified using double opt-in sign up process with telephone confirmation at place of work. SERMO invited currently active panel members by sending an e-mail which included a link to the Web-based survey. Inclusion criteria for the survey were physicians and nurse practitioners who practice in the United States; actively see patients; work in an individual, group, or hospital practice; and who have been practicing for at least 3 years. Quotas were set to reach 1000 primary care physicians and 250 nurse practitioners. Respondents were paid an honorarium which varied (US\$21-US\$90) based on the number of questions they were asked to complete. Respondents could exit the survey at any time. To protect respondent confidentiality, no individual identifiers were included in the database.

To reach the set quotas, 3110 health professionals were invited to participate. Of these, 2006 completed the entire survey (1003 primary care physicians including family physicians and internists, 250 pediatricians, 250 obstetricians and gynecologists, and 253 nurse practitioners). For this study, only primary care physicians and nurse practitioners were included because of our focus on the USPSTF recommendation for adults at risk for CVD. We also excluded respondents who described their main work setting as inpatient practice (n = 201) because our study focused on primary care counseling which typically occurs in outpatient practices (final analytic sample = 1055 respondents).

Measures

The 2016 DocStyles survey instrument was developed by Porter Novelli with technical guidance provided by federal public health agencies and other clients. DocStyles contained 144 questions and asked about PCPs' demographic characteristics (age, sex, race/ethnicity, and region) and medical practice (years in practice, main practice setting, teaching hospital privileges, and financial situation of the majority of patients).

Questions about intensive behavioral counseling were preceded by the statement, "Intensive behavioral counseling services are designed to help persons engage in healthy behaviors, such as healthy eating and physical activity, and limit unhealthy ones. These interventions typically involve multiple contacts over extended periods, include didactic education plus additional support, and are delivered by trained professionals." Primary care providers' awareness of local intensive behavioral counseling services was assessed with the question,

“Are there intensive behavioral counseling services that include physical activity promotion in your health system or community?”

Questions about physical activity counseling were preceded by the statement, “Patients who are overweight or obese and have hypertension, dyslipidemia, impaired fasting glucose, or the metabolic syndrome are considered at increased risk for cardiovascular disease (CVD). The next few questions are about your practices with these at-risk patients.” Primary care providers’ physical activity counseling practices were asked with the question, “With how many of your at-risk patients do you discuss physical activity?” Response options included “none,” “few (1%-25%),” “some (26%-50%),” “many (51%-75%),” or “most (>75%).” Primary care providers’ referral to intensive behavioral counseling practices was assessed with the question, “Of the at-risk patients with whom you discuss physical activity, how many do you refer to intensive behavioral counseling?” Response options included “none,” “few (1%-25%),” “some (26%-50%),” “many (51%-75%),” or “most (>75%).” For this question, respondents were grouped into the following 4 categories: “none,” “few,” “some,” and “many or most” because of small sample sizes.

To assess the services and providers to which PCPs refer for intensive behavioral counseling, PCPs were asked, “When referring patients to intensive behavioral counseling, to what services or providers do you refer?” Respondents were able to select all that apply and available responses were, “A health-care worker within my practice or group,” “A health-care worker outside my practice or group,” “Organized program in a medical facility,” “Organized program within the community setting,” and “Other/none of the above.” To classify the location of providers or services PCPs referred to, a respondent who selected only either “A health-care worker outside my practice or group” or “Organized program within the community setting” was categorized as referring “Only outside practice or group.” Those who selected either of these options plus either “A health-care worker within my practice or group” or “Organized program in a medical facility” were categorized as “Both within and outside practice or group.” These 2 groups combined were considered as referring outside their practice or group. Those who selected only either “A healthcare worker within my practice or group” or “Organized program in a medical facility” were categorized as “Only within practice or group.”

Analysis

We estimated the prevalence and 95% confidence intervals (CIs) for the following: (1) awareness of local intensive behavioral counseling services, (2) amount of at-risk patients referred to intensive behavioral counseling, (3) services and providers referred to for intensive behavioral counseling, and (4) location of providers or services. The prevalence was also stratified by the following where appropriate: PCP characteristics, awareness of local services, amount of at-risk patients with whom the PCP discusses physical activity, and amount of at-risk patients referred to intensive behavioral counseling. Pairwise *t*-tests and orthogonal polynomial contrasts were used to identify significant differences and trends where appropriate.

Logistic regression analyses were conducted to examine the odds of the following: (1) awareness of local services by PCP characteristics and (2) referring many or most at-

risk patients to intensive behavioral counseling by PCP characteristics and awareness of services (vs referring some, few, or none of their at-risk patients). *P* Values <.05 were considered statistically significant. Analyses were exempt from institutional review board approval because personal identifiers were not included in the data file and were conducted using SUDAAN Version 11.0 (Research Triangle Institute, Research Triangle Park, North Carolina).

Results

In our study sample, the majority of respondents were family physicians and internists; 45 years of age, male, non-Hispanic white, practiced in a group practice, did not have privileges at a teaching hospital, and were in practice for 11 to 20 years (Table 1).

Awareness of Local Intensive Behavioral Counseling Resources

In unadjusted analyses, the prevalence of awareness of local intensive behavioral counseling resources was higher among PCPs <45 years of age compared to those ≥45 years, among women compared to men, among nurse practitioners compared to internists and family physicians, among those in practice 3 to 5 years and 6 to 10 years compared to those in practice 11 to 20 years and >20 years, and among those with privileges at a teaching hospital compared to those without privileges (Table 2). After adjusting for PCP characteristics, significant differences remained with a greater adjusted odds of awareness among nurse practitioners compared to family physicians, among those in practice 3 to 5 years compared to those in practice >20 years, and among those with privileges at a teaching hospital compared to those without. In addition, with adjustment for PCP characteristics, internists had a greater adjusted odds of awareness compared to family physicians.

Referring At Risk Patients to Intensive Behavioral Counseling

Overall, 12.6% of PCPs reported referring many or most of their at-risk patients to intensive behavioral counseling (Table 3). In unadjusted analyses, this prevalence was greater among those aware of local intensive behavioral counseling resources compared to those not aware of such resources, among those who discussed physical activity with most of their at-risk patients compared to those who discussed physical activity with few of their at-risk patients, and among those in the race/ethnicity category “Other” compared to non-Hispanic whites, and among those with privileges at a teaching hospital compared to those without. After adjusting for PCP characteristics, significant differences remained with a greater adjusted odds of referring many or most at-risk patients to intensive behavioral counseling among those aware of local intensive behavioral counseling resources compared to those not aware of such resources, among those in the race/ethnicity category “Other” compared to non-Hispanic whites, and among those with privileges at a teaching hospital compared to those without. In addition, with adjustment for PCP characteristics, those who worked in a group practice also had a greater adjusted odds of referring many or most at-risk patients to intensive behavioral counseling compared to those who worked in an individual practice.

Services and Providers Referred to for Intensive Behavioral Counseling

Among PCPs who referred any at-risk patients to intensive behavioral counseling, the most frequently reported service or provider they referred to was an organized program in a medical facility (41.2%, Figure 1a). Other reported services or providers included an organized program within the community setting (35.2%), a health-care worker outside their practice or group (31.4%), a health-care worker within their practice or group (25.4%), or other/none of the above (6.7%). The prevalence of referring to a health-care worker within their practice or group, a program in a medical facility, and a program within the community setting increased as the reported amount of at-risk patients referred to intensive behavioral counseling increased ($P < .05$).

In terms of the location of the service or provider, among PCPs who referred any at-risk patients to intensive behavioral counseling, 58.1% referred outside their practice or group with 35.9% referring only outside their practice or group and 22.2% referring both within and outside their practice or group. In addition, 35.2% of PCPs referred only within their practice or group (Figure 1b). The prevalence of PCPs referring only outside their practice or group decreased as the reported amount of at-risk patients referred to intensive behavioral counseling increased, whereas the prevalence of PCPs referring both within and outside their practice or group increased as the reported amount of at-risk patients referred to intensive behavioral counseling increased ($P < .05$).

Discussion

We found that about half of PCPs who participated in the DocStyles survey were aware of local intensive behavioral counseling services that include physical activity promotion. Provider type, years in practice, and having privileges at a teaching hospital were significantly associated with awareness of local services. Only 1 in 8 PCPs referred many or most of their patients who are eligible for intensive behavioral counseling in keeping with the USPSTF recommendation,⁴ and awareness of local services was positively associated with this practice. Ensuring local programs exist and identifying ways to help increase PCPs' awareness of local services that include physical activity promotion may help to ensure they refer to intensive behavioral counseling as stated by the USPSTF recommendation.⁴

With less than half of PCPs reporting being aware of local resources for intensive behavioral counseling, several possible reasons may explain this finding. It may be that local services exist but providers are not aware of them or that local services simply do not exist, both of which are areas that would likely benefit from further attention. Efforts to engage communication between PCPs and local services may help facilitate raising awareness. Although we did observe differences in awareness by PCP specialty, years in practice, and having privileges at teaching hospital, these are difficult to explain since, to our knowledge, no previous studies have examined awareness of such resources among PCPs. Greater awareness of resources among certain PCP specialties and those with privileges at a teaching hospital may in part be due to such providers practicing within larger health systems where intensive behavioral counseling services are colocated. Efforts to add curriculum supportive of behavioral change interventions to some medical education programs may help explain greater awareness observed among PCPs who have been in practice for less

time.^{15, 16} In addition, our findings may identify a lack of existing resources in communities all together, such as in smaller communities where PCPs may be less likely to have privileges at a teaching hospital. Some PCPs were not aware of local resources but did refer eligible patients to intensive behavioral counseling. These PCPs may be referring patients to resources outside their local community, which may especially occur in small or rural communities. Overall, these identified differences may help efforts to either establish local resources or raise awareness of existing local resources among PCPs, particularly among small-practice family physicians whose clinics may be more isolated in the community.

We found that few PCPs referred their patients at risk for CVD to intensive behavioral counseling in keeping with the USPSTF recommendation.⁴ Although previous studies have assessed the frequency at which PCPs include select components of physical activity counseling such as assessing physical activity levels, providing written physical activity prescriptions, and arranging follow-up visits, none have assessed the prevalence of referrals to intensive behavioral counseling as done in this study.^{17–20} Moreover, we also found a positive association between PCPs referring many or most of their at-risk patients to intensive behavioral counseling and awareness of local services. Increasing the existence of national, state, and local resources that promote physical activity and ensuring PCPs are sufficiently aware of them may help PCPs refer to relevant services for behavior change.

Primary care providers face several additional barriers to lifestyle counseling and referrals, including those that relate to their attitudes and beliefs (eg, believing that counseling is not effective) and system-level barriers (eg, lack of resources, time, and reimbursement).^{7, 8} Programs such as Exercise is Medicine can provide a structured model for providers to help them assess their patients' physical activity levels and refer them to local behavioral support systems.²¹ In particular, using clinical protocols to link clinical assessment of physical activity with referral to community physical activity programming is an emerging approach to promote physical activity among primary care patients.²²

This study found that PCPs most commonly referred patients to an organized program in a medical facility for physical activity counseling. However, in terms of the location of services, the majority of PCPs referred to intensive behavioral counseling services outside their practice or group. In combination, these findings suggest that overall PCPs refer primarily to services that are organized programs and to those outside their practice. This highlights the importance of ensuring the availability and accessibility of nearby organized programs, given that behavioral counseling interventions are often more effective if delivered in a community setting.⁷ One way to potentially facilitate this connection is through effective community–clinical linkages.^{9–11, 23, 24}

Connections between community and clinical sectors can help ensure that people with or at high risk of chronic diseases have access to the resources they need to prevent, delay, or manage chronic conditions once they occur.⁹ The Centers for Disease Control and Prevention recommends coordinating chronic disease prevention efforts via community–clinical linkages and provides relevant tools in a practitioner's guide.⁹ According to this guide, the first step in developing community–clinical linkages is to learn as much as possible about organizations and resources in community and clinical sectors.⁹ In our study,

awareness of local services was associated with PCPs referring to intensive behavioral counseling. Various tools, frameworks, and case studies are available to help different sectors, including health-care providers, learn about local resources, and develop linkages that integrate clinical and community services.^{9, 12, 23–28}

Our study is subject to at least 4 limitations. First, DocStyles data are self-reported and subject to recall and social desirability bias. Second, the survey was not a nationally representative sample and so the results may not be generalizable. However, the age, sex, years of practice, and regional distributions of PCPs were similar in the 2016 DocStyles sample and the American Medical Association master file.²⁹ Third, DocStyles is a Web-based survey, which may introduce differences based on who is willing to use this format. However, being a large, national survey conducted among a diverse group of PCPs helps minimize this risk. Finally, lack of awareness of local resources may be due to either a lack of knowledge of existing resources by the PCP or simply the absence of such resources. In addition, services that PCPs refer to may not always be local, particularly in small communities. Additional research is needed to better understand the association between the actual presence of behavioral counseling services, either in a medical facility or surrounding community, and PCPs' awareness of them in order to develop effective communication and promotional efforts.

This study found that about half of PCPs who participated in the DocStyles survey were aware of local intensive behavioral counseling services that include physical activity promotion and that this awareness of services was associated with referring patients at risk for CVD to intensive behavioral counseling. In addition, we found that PCPs most commonly referred to intensive behavioral counseling services located outside their practice or group. Only 1 in 8 PCPs referred many or most of their patients eligible for intensive behavioral counseling in keeping with the USPSTF recommendation.⁴ Efforts that seek to expand the presence of local resources, raise PCPs' awareness of them, and create community–clinical linkages may help PCPs increase their uptake and implementation of this USPSTF recommendation for CVD prevention.

So What? Implications for Health Promotion Practitioners and Researchers

What is already known on this topic?

Physical inactivity is an important modifiable risk factor for cardiovascular disease (CVD). Primary care providers (PCPs) can play an important role in helping patients increase their physical activity through offering or referring to behavioral counseling. While ensuring that local behavioral counseling resources exist and that PCPs are aware of them is likely important, PCPs' awareness of these local services may influence referrals to them. Limited information exists regarding PCPs' awareness of local physical activity-related intensive behavioral counseling services, whether this awareness is associated with referring eligible patients, and the types and locations of services to which they refer.

What does this article add?

This study suggests that about half of PCPs are aware of local intensive behavioral counseling services that include physical activity promotion. Provider type, years in practice, and having privileges at a teaching hospital were significantly associated with awareness of local services. Only 1 in 8 PCPs referred many or most of their patients who are eligible for intensive behavioral counseling, and awareness of local services was positively associated with this practice. In addition, PCPs most often referred to services located outside their practice or group.

What are the implications for health promotion practice or research?

Efforts to establish local intensive behavioral counseling services that include physical activity promotion and improving PCPs' awareness of them, especially using community-clinical linkages, may help promote physical activity among adults at risk for CVD.

Funding

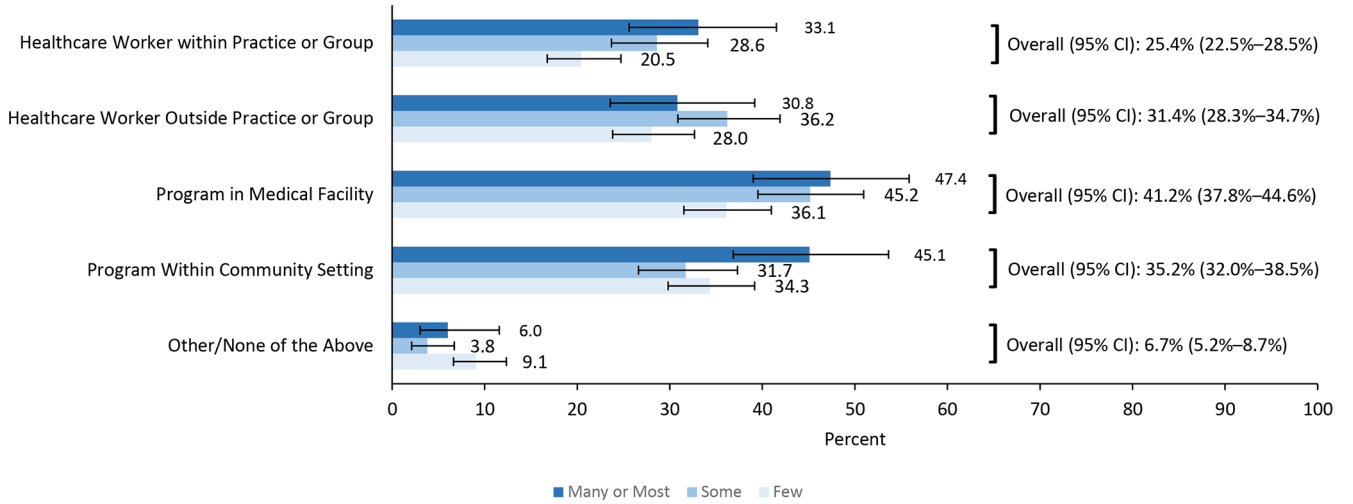
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(a) Services or Providers Referred To [select all that apply]



(b) Location of Healthcare Worker or Program Referred To [mutually exclusive]

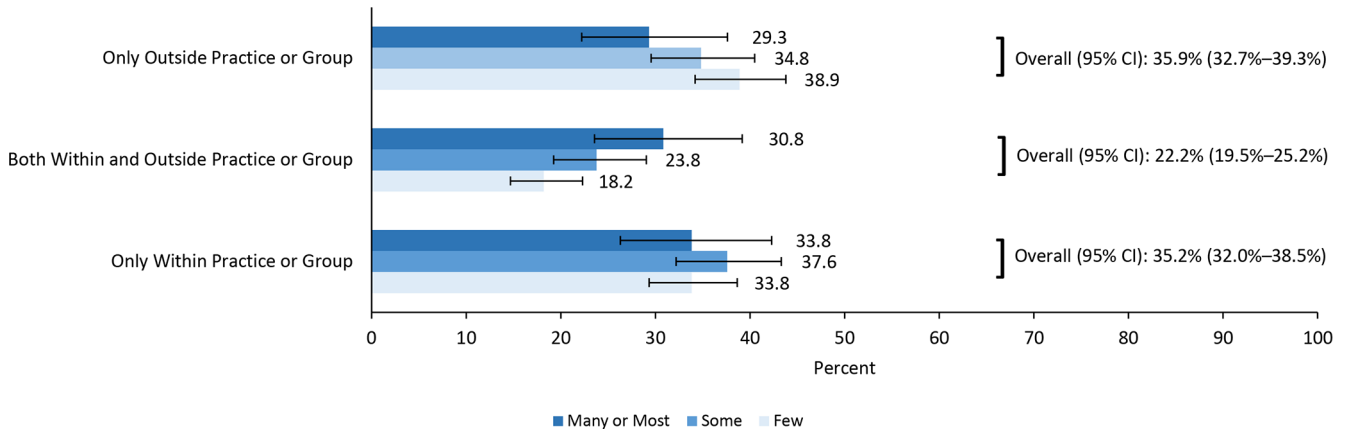


Figure 1.

Prevalence of services or providers and locations referred to by PCPs for intensive behavioral counseling, by amount of at-risk^a patients with whom PCP refers to intensive behavioral counseling, DocStyles 2016 (N = 819)^{b,c}.

CI, confidence interval; PCP, primary care provider.

^aPatients at increased risk for cardiovascular disease defined as those who are overweight or obese and have hypertension, dyslipidemia, impaired fasting glucose, or the metabolic syndrome.

^bExcludes respondents who selected “none” in response to either, “With how many of your at risk patients do you discuss physical activity?” or “of the at risk patients with whom you discuss physical activity, how many do you refer to intensive behavioral counseling?” (n = 236).

^cError bars represent 95% confidence intervals.

Table 1.Characteristics of Primary Care Providers, DocStyles 2016.^a

Primary Care Provider Characteristics	N	% (95% CI)
Age group, years		
<45	431	40.9 (37.9-43.9)
45	624	59.2 (56.1-62.1)
Sex		
Men	628	59.5 (56.5-62.5)
Women	427	40.5 (37.5-43.5)
Race/ethnicity		
Non-Hispanic white	678	64.3 (61.3-67.1)
Other ^b	377	35.7 (32.9-38.7)
Region		
South	216	20.5 (18.1-23.0)
Midwest	277	26.3 (23.7-29.0)
Northeast	346	32.8 (30.0-35.7)
West	216	20.5 (18.1-23.0)
Specialty		
Internist	393	37.3 (34.4-40.2)
Family physician	461	43.7 (40.7-46.7)
Nurse practitioner	201	19.1 (16.8-21.5)
Years in practice		
3-5	102	9.7 (8.0-11.6)
6-10	188	17.8 (15.6-20.3)
11-20	423	40.1 (37.2-43.1)
>20	342	32.4 (29.7-35.3)
Main practice setting		
Group practice	804	76.2 (73.5-78.7)
Individual practice	251	23.8 (21.3-26.5)
Has privileges at teaching hospital		
Yes	434	41.1 (38.2-44.1)
No	621	58.9 (55.9-61.8)
Financial situation of majority of patients		
Poor to lower middle class	325	30.8 (28.1-33.7)
Middle class	370	35.1 (32.2-38.0)
Upper middle class to affluent	360	34.1 (31.3-37.0)

Abbreviation: CI, confidence interval.

^aN = 1,055.^bDue to small sample sizes, the following groups were combined: non-Hispanic black (n = 235), Hispanic (n = 39), and non-Hispanic other (n = 303).

Table 2.

Prevalence and Adjusted Odds Ratios^a of Awareness of Local Intensive Behavioral Counseling Services by Primary Care Provider Characteristics, DocStyles 2016.^{b,c}

Primary Care Provider Characteristic	Awareness of Local Intensive Behavioral Counseling Services	
	% (95% CI)	AOR ^a (95% CI)
Total	49.9 (46.8-52.9)	NA
Age group, years		
<45	55.0 (50.3-59.6)	1.05 (0.73-1.49)
45	46.3 (42.4-50.2)	1.00
Sex		
Men	46.7 (42.8-50.6)	0.89 (0.66-1.19)
Women	54.6 (49.8-59.2)	1.00
Race/ethnicity		
Non-Hispanic white	49.7 (45.9-53.5)	1.00
Other	50.1 (45.1-55.2)	1.04 (0.79-1.37)
Region		
Midwest	49.1 (42.5-55.7)	1.00
South	48.7 (42.9-54.6)	0.95 (0.66-1.38)
Northeast	48.0 (42.7-53.3)	0.97 (0.68-1.38)
West	55.1 (48.4-61.6)	1.39 (0.94-2.05)
Specialty		
Family physician	45.0 (40.2-50.0)	1.00
Internist	49.7 (45.1-54.2)	1.35 (1.01-1.80)
Nurse practitioner	59.7 (52.8-66.3)	1.88 (1.22-2.88)
Years in practice		
3-5	64.7 (55.0-73.4)	1.90 (1.05-3.41)
6-10	58.5 (51.3-65.3)	1.51 (0.94-2.44)
11-20	45.9 (41.2-50.6)	0.94 (0.68-1.32)
>20	45.6 (40.4-50.9)	1.00
Main practice setting		
Individual practice	50.9 (47.4-54.3)	1.00
Group practice	46.6 (40.5-52.8)	0.95 (0.71-1.28)
Privileges at teaching hospital		
Yes	55.8 (51.0-60.4)	1.68 (1.29-2.19)
No	45.7 (41.8-49.7)	1.00
Financial situation of majority of patients		
Poor to lower middle class	49.5 (44.1-55.0)	1.00
Middle class	47.8 (42.8-52.9)	1.08 (0.79-1.48)
Upper middle class to affluent	52.2 (47.0-57.3)	1.20 (0.88-1.65)

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; NA, not applicable.

^aLogistic regression model adjusted for age group, sex, race/ethnicity, region, specialty, years in practice, main practice setting, privileges at a teaching hospital, and financial situation of majority of patients.

^bBoldface numerals indicates statistical significance, $P < .05$.

^cN = 1,055.

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Table 3.

Prevalence and Adjusted Odds Ratios^a of Referring At-Risk^b Patients to Intensive Behavioral Counseling by Primary Care Provider Characteristics, DocStyles 2016.^{c,d}

Primary Care Provider Characteristics	Amount of At-Risk ^b Patients With Whom PCP Reports Referring to Intensive Behavioral Counseling, % (95% CI)				PCP Refers Many or Most of Their At-Risk ^b Patients to Intensive Behavioral Counseling, AOR (95% CI)
	None ^e	Few	Some	Many or Most	
Total	22.4 (20.0-25.0)	37.5 (34.7-40.5)	27.5 (24.9-30.3)	12.6 (10.7-14.8)	NA
Aware of local intensive behavioral counseling services					
Yes	7.4 (5.5-10.0)	37.6 (33.6-41.9)	36.9 (32.9-41.1)	18.1 (15.0-21.6)	2.81 (1.85-4.25)
No	37.2 (33.2-41.5)	37.4 (33.4-41.6)	18.1 (15.1-21.7)	7.2 (5.3-9.7)	1.00
Amount of at-risk ^b patients PCP reports discussing physical activity					
Few	32.9 (22.9-44.6)	35.7 (25.4-47.5)	24.3 (15.7-35.7)	7.1 (3.0-16.1)	0.44 (0.16-1.17)
Some	17.1 (12.6-22.7)	31.3 (25.5-37.8)	41.0 (34.7-47.7)	10.6 (7.1-15.5)	0.66 (0.39-1.11)
Many	22.2 (17.7-27.4)	38.0 (32.6-43.8)	27.1 (22.3-32.6)	12.7 (9.3-17.1)	0.78 (0.50-1.22)
Most	22.4 (18.9-26.3)	40.8 (36.5-45.3)	22.4 (18.9-26.3)	14.4 (11.6-17.9)	1.00
Age group, years					
<45	20.6 (17.1-24.7)	35.7 (31.3-40.4)	29.5 (25.3-34.0)	14.2 (11.2-17.8)	1.36 (0.78-2.36)
45	23.6 (20.4-27.1)	38.8 (35.0-42.7)	26.1 (22.8-29.7)	11.5 (9.3-14.3)	1.00
Sex					
Men	21.2 (18.2-24.6)	38.7 (35.0-42.6)	28.0 (24.6-31.7)	12.1 (9.8-14.9)	0.91 (0.58-1.42)
Women	24.1 (20.3-28.4)	35.8 (31.4-40.5)	26.7 (22.7-31.1)	13.3 (10.4-16.9)	1.00
Race/ethnicity					
Non-Hispanic white	24.3 (21.2-27.7)	40.7 (37.1-44.5)	25.2 (22.1-28.6)	9.7 (7.7-12.2)	1.00
Other	18.8 (15.2-23.1)	31.8 (27.3-36.7)	31.6 (27.1-36.4)	17.8 (14.2-22.0)	2.09 (1.41-3.10)
Region					
Midwest	18.5 (13.9-24.3)	44.0 (37.5-50.7)	23.1 (18.0-29.3)	14.4 (10.3-19.7)	1.00
South	19.9 (15.6-25.0)	34.3 (28.9-40.1)	34.3 (28.9-40.1)	11.6 (8.3-15.9)	0.70 (0.40-1.22)
Northeast	28.3 (23.8-33.3)	37.6 (32.6-42.8)	22.5 (18.4-27.3)	11.6 (8.6-15.4)	0.75 (0.44-1.27)
West	19.9 (15.1-25.8)	35.2 (29.1-41.8)	31.0 (25.2-37.5)	13.9 (9.9-19.2)	0.89 (0.50-1.58)

Primary Care Provider Characteristics	Amount of At-Risk ^b Patients With Whom PCP Reports Referring to Intensive Behavioral Counseling, % (95% CI)				PCP Refers Many or Most of Their At-Risk ^b Patients to Intensive Behavioral Counseling, AOR (95% CI)
	None ^e	Few	Some	Many or Most	
Specialty					
Family physician	17.0 (13.6-21.1)	38.4 (33.7-43.3)	30.0 (25.7-34.8)	14.5 (11.4-18.3)	1.00
Internist	23.9 (20.2-28.0)	37.5 (33.2-42.0)	27.8 (23.9-32.0)	10.8 (8.3-14.0)	0.75 (0.48-1.18)
Nurse practitioner	29.4 (23.5-36.0)	35.8 (29.5-42.7)	21.9 (16.7-28.1)	12.9 (9.0-18.3)	0.97 (0.53-1.78)
Years in practice					
3-5	23.5 (16.3-32.7)	43.1 (33.9-52.9)	21.6 (14.6-30.6)	11.8 (6.8-19.6)	0.55 (0.21-1.48)
6-10	19.7 (14.6-26.0)	29.3 (23.2-36.2)	36.2 (29.6-43.3)	14.9 (10.5-20.7)	0.82 (0.39-1.72)
11-20	19.4 (15.9-23.4)	40.7 (36.1-45.4)	27.7 (23.6-32.1)	12.3 (9.5-15.8)	0.82 (0.48-1.39)
>20	27.2 (22.7-32.2)	36.5 (31.6-41.8)	24.3 (20.0-29.1)	12.0 (8.9-15.9)	1.00
Main practice setting					
Individual practice	20.8 (18.1-23.7)	39.4 (36.1-42.9)	28.2 (25.2-31.5)	11.6 (9.5-14.0)	1.00
Group practice	27.5 (22.3-33.4)	31.5 (26.0-37.5)	25.1 (20.1-30.8)	15.9 (11.9-21.0)	1.68 (1.10-2.59)
Privileges at teaching hospital					
Yes	17.1 (13.8-20.9)	36.2 (31.8-40.8)	31.3 (27.1-35.9)	15.4 (12.3-19.2)	1.52 (1.02-2.25)
No	26.1 (22.8-29.7)	38.5 (34.7-42.4)	24.8 (21.6-28.4)	10.6 (8.4-13.3)	1.00
Financial situation of majority of patients					
Poor to lower middle class	24.3 (19.9-29.3)	39.1 (33.9-44.5)	25.2 (20.8-30.2)	11.4 (8.4-15.3)	1.00
Middle class	22.4 (18.5-27.0)	40.0 (35.1-45.1)	25.4 (21.2-30.1)	12.2 (9.2-15.9)	1.06 (0.66-1.71)
Upper middle class to affluent	20.6 (16.7-25.1)	33.6 (28.9-38.7)	31.7 (27.1-36.7)	14.2 (10.9-18.2)	1.22 (0.76-1.97)

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; NA, not applicable; PCP, primary care provider.

^aLogistic regression model adjusted for awareness of intensive behavioral counseling resources, amount of at-risk patients PCP reports discussing physical activity, age group, sex, race/ethnicity, region, specialty, years in practice, main practice setting, privileges at a teaching hospital, and financial situation of majority of patients. Referring at-risk patients to intensive behavioral counseling was dichotomized into: (1) many or most and (2) none, few, or some.

^bPatients at increased risk for cardiovascular disease defined as those who are overweight or obese and have hypertension, dyslipidemia, impaired fasting glucose, or the metabolic syndrome.

^cBoldface numerals indicates statistical significance, $P < .05$.

^d $N = 1,055$.

^eIncludes respondents who selected "none" (n = 6) in response to the question, "with how many of your at risk patients do you discuss physical activity?"