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## Primary care providers' physical activity counseling and referral practices and barriers for cardiovascular disease prevention

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### Abstract

The US Preventive Services Task Force (USPSTF) recommends offering or referring adults who are overweight or obese and have additional cardiovascular disease (CVD) risk factors to intensive behavioral counseling interventions to promote a healthful diet and physical activity for CVD prevention. This study determined the proportion of primary care providers (PCPs) who discussed physical activity with most of their at-risk patients and referred them to intensive behavioral counseling, and reported barriers to counseling. Our analyses used data from DocStyles 2015, a Web-based panel survey of 1251 PCPs. Overall, 58.6% of PCPs discussed physical activity with most of their at-risk patients. Among these PCPs, the prevalence of components offered ranged from 98.5% encouraging increased physical activity to 13.9% referring to intensive behavioral counseling. Overall, only 8.1% both discussed physical activity with most at-risk patients and referred to intensive behavioral counseling. Barriers related to PCPs' attitudes and beliefs about counseling (e.g., counseling is not effective) were significantly associated with both discussing physical activity with most at-risk patients and referring them to intensive behavioral counseling (adjusted odds ratio, 1.92; 95% confidence interval, 1.15–3.20). System-level barriers (e.g., referral services not available) were not. Just over half of PCPs discussed physical activity with most of their at-risk patients, and few both discussed physical activity and referred patients to

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#### Disclaimer

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.

#### Conflict of interest statement

The authors declare that there are no conflicts of interest.

#### Transparency document

The Transparency document associated with this article can be found in online version.

intensive behavioral counseling. Overcoming barriers related to attitudes and beliefs about physical activity counseling could help improve low levels of counseling and referrals to intensive behavioral counseling for CVD prevention.

## Keywords

Counseling; Primary health care; Physical activity; Cardiovascular disease

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## 1. Introduction

Cardiovascular disease (CVD) is the leading cause of death in the United States, and physical inactivity is an important modifiable risk factor (Writing Group Members et al., 2016). Health care professionals can contribute to CVD prevention by counseling patients to increase their physical activity. The US Preventive Services Task Force (USPSTF) recommends that adults who are overweight or obese 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 (LeFevre and US Preventive Service Task Force, 2014). Over 1 in 3 US adults is eligible for this intensive behavioral counseling, and almost 1 in 5 US adults is both eligible and does not meet the guideline for aerobic physical activity from the *2008 Physical Activity Guidelines for Americans*, (Omura et al., 2015; US Department of Health and Human Services, 2008) presenting an opportunity to improve health at the population level.

Primary care providers (PCPs) have a unique opportunity to engage patients and promote physical activity, as over 80% of US adults see a physician annually, (Centers for Disease Control and Prevention, 2015) and provider advice influences patients' healthy lifestyle behaviors (Elley et al., 2003; Grandes et al., 2009). Furthermore, patients expect physicians to be resources of preventive health information (Carroll et al., 2008; Cogswell and Eggert, 1993; Stanford and Solberg, 1991). Given such supporting evidence, the American Heart Association has included reimbursement for and delivery of physical activity and physical fitness counseling with an exercise prescription and integrated systems of care as a public policy strategy (Labarthe et al., 2016). However, PCPs encounter several system-level barriers to lifestyle counseling, including a lack of resources and time (Diehl et al., 2015; Walsh et al., 1999; Douglas et al., 2006; Josyula and Lyle, 2013; McKenna et al., 1998; Goodman et al., 2011; Krist et al., 2015; Lin et al., 2014; Hebert et al., 2012; Abramson et al., 2000). PCPs also face barriers that relate to their personal attitudes and beliefs, such as believing that they have insufficient knowledge about counseling recommendations or that counseling is ineffective at changing behavior (Diehl et al., 2015; Walsh et al., 1999; Douglas et al., 2006; Hebert et al., 2012).

Most past research on PCP practices and barriers related to physical activity counseling has focused on counseling for the general population (Walsh et al., 1999; Hebert et al., 2012; Bock et al., 2012; Gnanendran et al., 2011; Carroll et al., 2011; Anis et al., 2004; Podl et al., 1999; Stange et al., 1998; Stange et al., 2000; Ludman and Curry, 2015; Whitlock et al., 2002). To our knowledge, no studies have specifically examined PCP practices for patients

at risk for CVD, which the USPSTF defines as patients who are overweight or obese and have hypertension, dyslipidemia, impaired fasting glucose, or the metabolic syndrome (LeFevre and US Preventive Service Task Force, 2014). Initiating a general discussion about physical activity can be an important first step in promoting behavior change. Physical activity counseling can include a variety of additional components, such as assessing physical activity levels or prescribing physical activity (Diehl et al., 2015; Walsh et al., 1999; Glasgow et al., 2001; Smith et al., 2011). Components that are more intensive may be more effective in promoting behavior change, particularly for patients at risk for CVD. The component currently recommended by the USPSTF for this population is offering or referring them to intensive behavioral counseling interventions (LeFevre and US Preventive Service Task Force, 2014).

The objectives of this study were three-fold. First, we sought to determine the proportion of PCPs who discussed physical activity with most of their patients at risk for CVD. Second, we examined the components included in this counseling, focusing on referral to intensive behavioral counseling. Third, we examined how counseling patterns for patients at risk for CVD were associated with reported barriers. Our findings describe PCPs' current practices related to physical activity counseling for at-risk patients and could be used to develop strategies to overcome barriers to counseling.

## 2. Methods

### 2.1. Study sample

From June to July 2015, Porter Novelli Public Services conducted the Web-based survey DocStyles. Quotas were set to reach 1000 primary care physicians and 250 nurse practitioners. Respondents were paid an honorarium which varied (\$21–\$90) based on the number of questions they were asked to complete.

Samples were drawn from SERMO's Global Medical Panel, which includes 51,000 primary care physicians and 2400 nurse practitioners in the US (SERMO, 2017; Porter Novelli, 2015). The majority of primary care physicians in the panel were male (61%), with an average age of 54 years and 28 years in practice (Porter Novelli, 2015). The majority of nurse practitioners in the panel were female (84%), with an average age of 49 years and 13 years in practice (Porter Novelli, 2015). Panelists are verified using a double opt-in sign up process with telephone confirmation at place of work. SERMO invited currently active panel members by sending an email which included a link to the Web-based survey. Inclusion criteria for the survey included physicians and nurse practitioners who practice in the United States; actively see patients; work in an individual, group, or hospital practice; and have been practicing for at least 3 years. Respondents could exit the survey at any time. To protect respondent confidentiality, no individual identifiers were included in the database.

To reach the quotas, 2281 health care professionals were invited to participate. Of this sample, 1751 completed the entire survey (1000 primary care physicians, 250 pediatricians, 250 obstetricians and gynecologists, and 251 nurse practitioners). We included only primary care physicians and nurse practitioners in our study because of our focus on the USPSTF recommendation for adult patients at risk for CVD. We also excluded respondents who

described their main work setting as inpatient practice ( $n=206$ ) because our study focused on primary care counseling, which typically occurs in outpatient practices. The result was a final sample size of 1045 respondents.

## 2.2. Measures

The 2015 DocStyles survey was developed by Porter Novelli with technical guidance provided by federal public health agencies and other nonprofit and for-profit clients. The survey contained 144 questions and asked about PCP characteristics including demographics (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 their patients).

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 three questions are about your practices with these AT RISK PATIENTS.” PCPs’ physical activity counseling practices were assessed 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%).”

Respondents were grouped into the following three categories: “Few or Some,” “Many,” and “Most.” To assess the components included in physical activity counseling, PCPs were asked, “What do you include when discussing physical activity with your at risk patients?” Respondents were able to select all that apply, and available responses were “Encourage increased physical activity,” “Assess their current physical activity level,” “Provide written educational materials,” “Write an exercise prescription,” “Referral to intensive behavioral counseling,” and “None of these.”

To assess barriers to physical activity counseling, PCPs were asked, “When you do not discuss physical activity with at risk patients, what is typically the main reason(s)?” Responses were categorized as pertaining to either attitude or belief barriers (“I don’t know what to recommend,” “I don’t think counseling is effective,” or “Patients won’t do it”) or system-level barriers (“Referral services aren’t available,” “Not enough time during visit,” “Insurance doesn’t cover it,” or “Other/None of these”).

## 2.3. Statistical analyses

For this cross-sectional study, the prevalence and associated standard error were calculated for the following: (1) discussion of physical activity with at-risk patients overall; (2) selected components of counseling among PCPs who discussed physical activity with any at-risk patients; (3) referral to intensive behavioral counseling among PCPs who discussed physical activity with most at-risk patients; (4) both discussion of physical activity with most at-risk patients and referral to intensive behavioral counseling; and (5) barriers to physical activity counseling overall. The prevalence was also stratified by the following where appropriate: (1) PCP characteristics (age group, sex, race/ethnicity, region, specialty, years in practice, main practice setting, having privileges at a teaching hospital, and the financial situation of the majority of patients); (2) the reported percentage of patients at risk for CVD counseled; or (3) the PCP’s status of both discussing physical activity with most at-risk patients and

referring them to intensive behavioral counseling. Pairwise *t*-tests identified significant differences by characteristics, and orthogonal polynomial contrasts identified significant trends by the reported percentage of at-risk patients who were counseled, where appropriate.

Logistic regression analyses that adjusted for other PCP characteristics (age group, sex, race/ethnicity, region, specialty, years in practice, main practice setting, having privileges at a teaching hospital, and the financial situation of the majority of patients) were conducted to examine the association between the following: (1) PCP characteristics with discussing physical activity with most at-risk patients versus not; (2) PCP characteristics with both discussing physical activity with most at-risk patients and referring them to intensive behavioral counseling versus not; (3) reporting either attitude and belief barriers or system-level barriers with the percentage of at-risk patients with whom the PCP discusses physical activity (referent group: most); and (4) reporting either attitude and belief barriers or system-level barriers with not both discussing physical activity with most at-risk patients and referring them to intensive behavioral counseling (referent group: both discussing physical activity with most at risk patients and referring to intensive behavioral counseling). In addition, among PCPs who discussed physical activity with most at-risk patients, a logistic regression analysis that adjusted for other PCP characteristics examined the association of PCP characteristics with referring patients to intensive behavioral counseling versus not. *P*-values < 0.05 were considered statistically significant. Our analyses were exempt from institutional review board approval because personal identifiers were not included in the data file. All analyses were conducted in 2017 using SUDAAN Version 11.0 (Research Triangle Institute, Research Triangle Park, NC).

### 3. 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; and did not have privileges at a teaching hospital.

#### 3.1. Discussing physical activity with at-risk patients

The prevalence of PCPs discussing physical activity with their at-risk patients is shown in Table 1. The prevalence of this discussion with most at-risk patients was higher among PCPs who identified as non-Hispanic white compared to “Other,” among PCPs working in the South compared to those in the Northeast, among nurse practitioners compared to internists, and among those in practice > 20 years compared to those in practice 3–5 years and 11–20 years. After adjusting for PCP characteristics, significant differences remained, with a lower adjusted odds among PCPs in the race/ethnicity category “Other” compared to their non-Hispanic white counterparts, among those working in the Northeast compared to those in the South, and among those in practice for 3–5 years and 11–20 years compared to those in practice for > 20 years (Table 1).

#### 3.2. Reported components of physical activity counseling

Among PCPs who discussed physical activity with any of their at-risk patients, the most frequently reported component of counseling was encouraging increased physical activity

(92.7%). Other reported components included assessing patients' current physical activity level (78.7%), providing written educational materials (45.1%), writing an exercise prescription (25.6%), and referring to intensive behavioral counseling (15.1%). For PCPs who discussed physical activity with any of their at-risk patients, the prevalence of encouraging increased physical activity, assessing current physical activity levels, and providing written education materials increased as the percentage of at-risk patients counseled increased (Fig. 1).

Among PCPs who discussed physical activity with most of their at-risk patients, the prevalence of referring to intensive behavioral counseling was higher among PCPs in the race/ethnicity category "Other" compared to non-Hispanic whites, among internists compared to nurse practitioners, among those who worked in a group practice compared to those in an individual practice, and among those with privileges at a teaching hospital compared to those without privileges (Table 2). After adjusting for PCP characteristics, significant differences in the prevalence of PCPs referring patients to intensive behavioral counseling remained, with a lower adjusted odds among PCPs who worked in an individual practice compared to those in a group practice and a higher adjusted odds among those with privileges at a teaching hospital compared to those without privileges.

Overall, the prevalence of both discussing physical activity with most at-risk patients and referring to intensive behavioral counseling was higher among PCPs who worked in a group practice compared to those in an individual practice and among those with privileges at a teaching hospital compared to those without privileges (Table 2). After adjusting for PCP characteristics, only the difference by teaching hospital privileges remained significant.

### 3.3. Reported barriers to physical activity counseling

In terms of attitude and belief barriers, 35.4% of PCPs selected "Patients won't do it," 10.0% selected "I don't think counseling is effective," and 4.2% selected "I don't know what to recommend." For system-level barriers, 60.9% of respondents selected "Not enough time during visit," 12.1% selected "Insurance doesn't cover it," and 11.4% selected "Referral services aren't available." In addition, 15.2% selected "Other/None of these."

The prevalence of reporting attitude and belief barriers was higher among PCPs who reported discussing physical activity with many and few or some of their at-risk patients, compared to those who reported discussing physical activity with most at-risk patients (Table 3). The prevalence of reporting system-level barriers was higher among PCPs who reported discussing physical activity with many and few or some of their at-risk patients, compared to those who reported discussing physical activity with most at-risk patients. These differences remained significant after adjusting for PCP characteristics.

The prevalence of reporting attitude and belief barriers was also higher among PCPs who did not both discuss physical activity with most of their at-risk patients and refer them to intensive behavioral counseling compared to those who did, and this difference remained significant after adjusting for PCP characteristics. No significant differences in the prevalence of reporting system-level barriers was observed when comparing PCPs who did

and did not both discuss physical activity with most at-risk patients and refer them to intensive behavioral counseling.

#### 4. Discussion

We found that just over half of PCPs who participated in the DocStyles survey discussed physical activity with most of their patients at risk for CVD. Only 8.1% both discussed physical activity with most of their at-risk patients and referred them to intensive behavioral counseling. As anticipated, system-level barriers to providing counseling and referrals, especially a lack of time, were most commonly reported by PCPs overall. Attitude and belief barriers were reported more among PCPs who did not both discuss physical activity with most of their at-risk patients and refer them to intensive behavioral counseling. PCP attitudes and beliefs about physical activity counseling were found to be significant barriers. Interventions designed to address physician concerns about what to recommend and whether counseling is effective at changing patient behavior may help encourage them to offer or refer to intensive behavioral counseling, as recommended by the USPSTF.

Studies assessing the proportion of patients to whom PCPs provide physical activity counseling have reported varying estimates (Walsh et al., 1999; Bock et al., 2012; Gnanendran et al., 2011; Carroll et al., 2011; Anis et al., 2004; Podl et al., 1999). These studies have usually focused on the general population, rather than specifically adults with CVD risk factors. One study that did examine more specific populations reported that 41% of physicians said they would give advice on physical activity to patients with ischemic heart disease, and 77% would give advice to patients who were overweight (Lawlor et al., 1999). However, these estimates do not capture the population specified in the USPSTF recommendation (LeFevre and US Preventive Service Task Force, 2014). In our study, 58.6% of PCPs reported discussing physical activity with most of their patients with CVD risk factors, highlighting opportunities for PCPs to initiate physical activity counseling among more of their at-risk patients.

As part of physical activity counseling, PCPs may include various components, such as assessing physical activity levels or prescribing physical activity (Diehl et al., 2015; Walsh et al., 1999; Glasgow et al., 2001; Smith et al., 2011). A study that measured adoption of the 5A model (Assess, Advise, Agree, Assist, Arrange) for physical activity counseling found that 80.7% of PCPs assessed physical activity levels, 81.3% advised patients to increase insufficient levels, 11.4% provided written physical activity prescriptions, 74.9% offered assistance to patients, and 46.3% arranged follow-up visits with patients (Diehl et al., 2015). Our study found similar results for counseling provided to patients at risk for CVD rather than the general population. However, in our sample more PCPs reported encouraging increased physical activity (92.7%) and writing an exercise prescription (25.6%), and fewer reported assessing patients' current physical activity level (78.7%). Of these selected components, only offering or referring to intensive behavioral counseling is recommended by the USPSTF. Our study is unique in that we examined whether PCPs both discussed physical activity with their at-risk patients and referred them to intensive behavioral counseling. This measurement provides a useful way to monitor compliance with the USPSTF recommendation because PCPs likely need to initiate a discussion around healthy

behaviors before referring to intensive behavioral counseling. Our study found that only 8.1% of PCPs both discussed physical activity with most of their at-risk patients and referred them to intensive behavioral counseling. Our finding that PCPs who worked in a group practice compared to those in an individual practice and with privileges at a teaching hospital compared to those without such privileges had a higher adjusted odds of this practice may be in part due to such providers practicing within larger health systems where intensive behavioral counseling services are co-located.

In our study, system-level barriers were most frequently reported by PCPs, with the most common being lack of time. This finding is consistent with previous studies, (Walsh et al., 1999; Hebert et al., 2012; Abramson et al., 2000) including one in which 61% of PCPs surveyed reported inadequate time as a barrier to exercise counseling (Abramson et al., 2000). Similarly, our study found that 60.9% of PCPs reported lack of time as a barrier. However, previous studies have typically identified barriers to physical activity counseling for the general population. To increase the use of physical activity counseling for patients with CVD risk factors, it is necessary to identify and overcome the barriers specifically associated with this intervention. Although systemlevel barriers were most commonly reported by PCPs, our study identified that attitude and belief barriers were more prevalent among PCPs who did not both discuss physical activity with their at-risk patients and refer them to intensive behavioral counseling.

Our findings suggest that interventions that focus on the attitudes and beliefs of PCPs may encourage them to offer or refer patients to intensive behavioral counseling as recommended by the USPSTF (LeFevre and US Preventive Service Task Force, 2014). Some PCPs may not know what to recommend or believe that counseling is ineffective. To address this problem, lifestyle medicine training is being added to some medical education programs, and this training may help to change the knowledge and perceptions of behavioral counseling and its benefits among future health care providers (Nawaz et al., 2016; Antognoli et al., 2016). Health care providers may also gain counseling skills through continuing medical education (Davis et al., 1995). Adopting effective clinical tools—such as the 5A model which has been shown to increase healthy behaviors in patients—may help improve the ability of clinicians to talk with their patients about health behavior change (Carroll et al., 2008; Whitlock et al., 2002; Pinto et al., 2005; Petrella et al., 2003; Estabrooks et al., 2003). Programs such as Exercise is Medicine provide a structured model for providers to assess their patients' physical activity levels and refer them to local behavioral support systems (American College of Sports Medicine, 2014). Providing exercise prescriptions may also be an effective way for providers to give patients physical activity advice, especially when done as part of a multicomponent intervention (Smitherman et al., 2007). Health care providers and systems can also work within their local communities to form community-clinical linkages that increase patient access to behavior change resources and provide an effective approach to preventing chronic diseases, including CVD (Centers for Disease Control and Prevention, 2016).

Our study is subject to at least four limitations. First, DocStyles data are self-reported and subject to recall and social desirability bias. Second, the survey was not a nationally representative sample of physicians or nurse practitioners, and the results may not be



generalizable. In addition, since the sample was not randomly selected, respondents to the survey may differ from those who did not respond. However, the age, sex, years of practice, and regional distributions of PCPs were similar between the 2015 DocStyles sample and the American Medical Association master file (Porter Novelli, 2015). Third, DocStyles questions are not evaluated for reliability or validity. However, DocStyles is developed with technical guidance from clinical medicine and public health experts and provides unique insight into US health professionals. Finally, DocStyles is a Web-based survey, which may introduce differences based on who is willing to use this format. However, DocStyles is a large, national survey conducted among a diverse group of PCPs, which helps to minimize this risk.

## 5. Conclusion

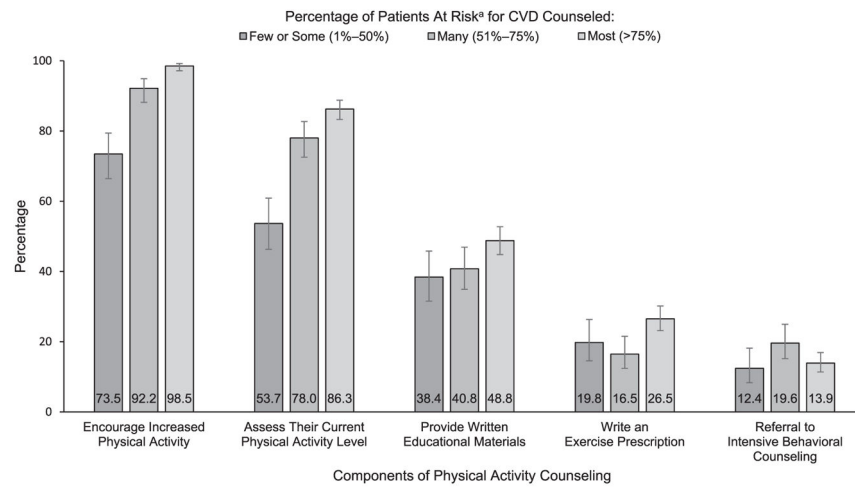
This study found that just over half of PCPs discussed physical activity with most of their patients at risk for CVD, and only a few both had this discussion and referred their patients to intensive behavioral counseling. With almost 1 in 5 US adults both eligible for intensive behavioral counseling and not meeting the guideline for aerobic physical activity from the *2008 Physical Activity Guidelines for Americans*, (Omura et al., 2015; US Department of Health and Human Services, 2008) increased provision of physical activity counseling by health care providers may improve health at the population level. Efforts that seek to have a positive influence on PCPs' attitudes and beliefs about such counseling may help to align PCP practices with the USPSTF recommendation for CVD prevention.

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**Fig. 1.** Components of physical activity counseling by percentage of at-risk<sup>a</sup> patients counseled ( $N = 1043$ )<sup>b,c</sup>, DocStyles, 2015.

<sup>a</sup> Patients at increased risk for CVD defined as those who are overweight or obese and have hypertension, dyslipidemia, impaired fasting glucose, or the metabolic syndrome.

<sup>b</sup> Excludes primary care providers (PCPs) who selected “None” ( $n = 2$ ) in response to the question, “With how many of your at risk patients do you discuss physical activity?”

<sup>c</sup> Error bars represent 95% confidence intervals.

**Table 1**

Prevalence and adjusted odds ratios<sup>a</sup> of discussing physical activity with at-risk patients<sup>b</sup> by PCP characteristics, DocStyles 2015.

Primary care provider characteristic	Sample size 1043 <sup>c</sup>	Percentage of at-risk patients <sup>b</sup> with whom PCP reports discussing physical activity (N = 1043) <sup>c</sup>			Many (51%–75%)			Most (> 75%)			Adjusted odds ratio <sup>a</sup> of PCP discussing physical activity with most at-risk patients
		N	%	SE	%	SE	%	SE	AOR	95% CI	
Total	1045	17.0	1.2	1.3	24.4	1.3	58.6	1.5	–	–	
Age, y											
< 45	475	20.3	1.9	2.0	24.1	2.0	55.6	2.3	1.03	(0.71–1.49)	
45	570	14.2	1.5	1.8	24.7	1.8	61.1	2.0	Ref	Ref	
Sex											
Male	657	18.3	1.5	1.7	24.8	1.7	56.9	1.9	0.85	(0.63–1.15)	
Female	388	14.7	1.8	2.2	23.8	2.2	61.5	2.5	Ref	Ref	
Race/ethnicity											
Non-Hispanic white	664	13.9	1.3	1.6	22.9	1.6	63.3	1.9	Ref	Ref	
Other <sup>e</sup>	381	22.4	2.1	2.3	27.2	2.3	50.4	2.6	0.64	(0.49–0.84)	
Region											
South	347	15.9	2.0	2.2	21.4	2.2	62.7	2.6	Ref	Ref	
Midwest	237	16.9	2.4	2.9	26.2	2.9	57.0	3.2	0.74	(0.52–1.07)	
Northeast	251	17.5	2.4	2.8	27.9	2.8	54.6	3.1	0.67	(0.48–0.95)	
West	210	18.2	2.7	2.9	23.4	2.9	58.4	3.4	0.84	(0.59–1.21)	
Specialty											
Internist	405	21.7	2.1	2.1	24.2	2.1	54.1	2.5	Ref	Ref	
Family physician	453	13.9	1.6	2.1	25.9	2.1	60.2	2.3	1.25	(0.94–1.66)	
Nurse practitioner	187	14.0	2.5	3.0	21.5	3.0	64.5	3.5	1.29	(0.83–1.98)	
Years in practice											
3–5	101	24.0	4.3	4.3	24.0	4.3	52.0	5.0	0.54	(0.30–0.98)	
6–10	244	17.3	2.4	2.8	24.7	2.8	58.0	3.2	0.74	(0.46–1.21)	
11–20	398	19.6	2.0	2.2	25.4	2.2	55.0	2.5	0.65	(0.46–0.93)	
> 20	302	10.9	1.8	2.4	23.2	2.4	65.9	2.7	Ref	Ref	

Primary care provider characteristic	Sample size 1043 <sup>c</sup>	Percentage of at-risk patients <sup>b</sup> with whom PCP reports discussing physical activity (N = 1043) <sup>c</sup>			Adjusted odds ratio <sup>d</sup> of PCP discussing physical activity with most at-risk patients				
		Few or some (1%-50%) <sup>d</sup>	Many (51%-75%)	Most (> 75%)	AOR	95% CI			
	N	%	SE	%	SE	%	SE	AOR	95% CI
Main practice setting									
Group practice	803	17.0	1.3	24.6	1.5	58.5	1.7	Ref	Ref
Individual practice	242	17.0	2.4	24.1	2.8	58.9	3.2	0.95	(0.70-1.29)
Has privileges at teaching hospital									
Yes	440	17.8	1.8	24.4	2.1	57.8	2.4	1.05	(0.80-1.37)
No	605	16.4	1.5	24.5	1.8	59.2	2.0	Ref	Ref
Financial situation of majority of patients <sup>f</sup>									
Poor to lower middle class	305	17.1	2.2	25.0	2.5	57.9	2.8	Ref	Ref
Middle class	375	17.1	2.0	22.2	2.2	60.7	2.5	1.14	(0.82-1.56)
Upper middle class to affluent	365	16.7	2.0	26.3	2.3	57.0	2.6	0.95	(0.70-1.31)

Abbreviations: PCP, primary care provider; SE, standard error; AOR, adjusted odds ratio; and CI, confidence interval.

<sup>a</sup>Logistic 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.

<sup>b</sup>Patients 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.

<sup>c</sup>Excludes PCPs who selected "none" (n = 2) in response to the question "with how many of your at risk patients do you discuss physical activity?"

<sup>d</sup>Respondents who selected "few" or "some" in response to the question "with how many of your at risk patients do you discuss physical activity?" were combined.

<sup>e</sup>Because of small sample sizes, the following groups were combined: Non-Hispanic black (n = 24), Hispanic (n = 39), and non-Hispanic other (n = 318).

<sup>f</sup>Reported by primary care provider.

**Table 2**

Referral to intensive behavioral counseling, among and combined with discussing PA with most at-risk<sup>a</sup> patients, DocStyles 2015.

Primary care provider characteristic	Among PCPs who discuss PA with most at-risk <sup>a</sup> patients (N = 611)				Overall (N = 1043) <sup>b</sup>			
	Refers to intensive behavioral counseling		Adjusted odds ratio <sup>c</sup> of referring to intensive behavioral counseling		Discusses PA with most at-risk <sup>a</sup> patients and refers to intensive behavioral counseling		Adjusted odds ratio <sup>c</sup> of discussing PA with most at-risk <sup>a</sup> patients and referring to intensive behavioral counseling	
	%	SE	AOR	95% CI	%	SE	AOR	95% CI
Total	13.9	1.4	-	-	8.1	0.8	-	-
Age, y								
< 45	14.4	2.2	0.6	(0.29–1.36)	8.0	1.3	0.70	(0.36–1.35)
45	13.5	1.8	Ref	Ref	8.2	1.2	Ref	Ref
Sex								
Male	13.4	1.8	0.7	(0.41–1.19)	7.6	1.0	0.69	(0.42–1.14)
Female	14.7	2.3	Ref	Ref	9.0	1.5	Ref	Ref
Race/ethnicity								
Non-Hispanic white	11.9	1.6	Ref	Ref	7.5	1.0	Ref	Ref
Other	18.3	2.8	1.5	(0.90–2.51)	9.2	1.5	1.20	(0.74–1.95)
Region								
South	11.5	2.2	Ref	Ref	7.2	1.4	Ref	Ref
Midwest	14.8	3.1	1.2	(0.59–2.27)	8.4	1.8	1.06	(0.56–2.00)
Northeast	17.5	3.2	1.3	(0.71–2.53)	9.6	1.9	1.14	(0.62–2.08)
West	13.1	3.1	1.1	(0.55–2.27)	7.7	1.8	1.06	(0.54–2.08)
Specialty								
Internist	16.4	2.5	Ref	Ref	8.9	1.4	Ref	Ref
Family physician	14.0	2.1	0.9	(0.55–1.59)	8.4	1.3	1.05	(0.63–1.73)
Nurse practitioner	9.2	2.6	0.5	(0.22–1.16)	5.9	1.7	0.65	(0.29–1.49)
Years in practice								
3–5	11.5	4.4	1.3	(0.40–4.47)	6.0	2.4	0.91	(0.31–2.69)
6–10	18.4	3.3	2.0	(0.78–5.06)	10.7	2.0	1.52	(0.66–3.48)
11–20	13.2	2.3	1.2	(0.62–2.24)	7.3	1.3	0.97	(0.52–1.82)

Primary care provider characteristic	Among PCPs who discuss PA with most at-risk <sup>a</sup> patients (N = 611)				Overall (N = 1043) <sup>b</sup>			
	Refers to intensive behavioral counseling		Adjusted odds ratio <sup>c</sup> of referring to intensive behavioral counseling		Discusses PA with most at-risk <sup>d</sup> patients and refers to intensive behavioral counseling		Adjusted odds ratio <sup>c</sup> of discussing PA with most at-risk <sup>d</sup> patients and referring to intensive behavioral counseling	
	%	SE	AOR	95% CI	%	SE	AOR	95% CI
> 20	12.1	2.3	Ref	Ref	7.9	1.6	Ref	Ref
Main practice setting								
Group practice	15.6	1.7	Ref	Ref	9.1	1.0	Ref	Ref
Individual practice	8.5	2.3	0.5	(0.25–1.00)	5.0	1.4	0.56	(0.29–1.09)
Has privileges at teaching hospital								
Yes	19.4	2.5	1.9	(1.10–3.11)	11.2	1.5	1.81	(1.10–2.97)
No	10.1	1.6	Ref	Ref	6.0	1.0	Ref	Ref
Financial situation of majority of patients <sup>d</sup>								
Poor to lower middle class	14.2	2.6	Ref	Ref	8.2	1.6	Ref	Ref
Middle class	14.5	2.3	1.0	(0.56–1.81)	8.8	1.5	1.05	(0.61–1.82)
Upper middle class to affluent	13.0	2.3	0.9	(0.50–1.65)	7.4	1.4	0.85	(0.48–1.50)

Abbreviations: PA, physical activity; PCP, primary care provider; SE, standard error; AOR, adjusted odds ratio; and CI, confidence interval.

<sup>a</sup>Patients 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.

<sup>b</sup>Excludes PCPs who selected “none” (n = 2) in response to the question, “with how many of your at risk patients do you discuss physical activity?”

<sup>c</sup>Logistic 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.

<sup>d</sup>Reported by primary care provider.



**Table 3**

Reported barriers to discussing physical activity with at-risk<sup>a</sup> patients (N = 1043)<sup>b</sup>, DocStyles 2015.

	Overall prevalence of reporting			Adjusted odds ratio <sup>c</sup>				
	Attitude and belief barriers <sup>d</sup>		System-level barriers <sup>d</sup>		Reporting attitude and belief barriers <sup>d</sup>		Reporting system-level barriers <sup>d</sup>	
	%	SE	%	SE	AOR	95% CI	AOR	95% CI
Total	42.5	1.5	69.1	1.4	—	—	—	—
Proportion of at-risk <sup>a</sup> patients with whom PCP discusses physical activity								
Most (> 75%)	37.5	2.0	65.0	1.9	Ref	Ref	Ref	Ref
Many (51%–75%)	49.4	3.1	75.7	2.7	1.76	(1.30–2.39)	1.76	(1.25–2.46)
Few or some (1%–50%)	49.7	3.8	74.0	3.3	1.70	(1.20–2.42)	1.48	(1.00–2.19)
PCP discusses physical activity with most at-risk <sup>a</sup> patients and refers them to intensive behavioral counseling								
Yes	29.4	4.9	69.4	5.0	Ref	Ref	Ref	Ref
No	43.6	1.6	69.1	1.5	1.92	(1.15–3.20)	1.13	(0.69–1.86)

Abbreviations: PCP, primary care provider; SE, standard error; AOR, adjusted odds ratio; and CI, confidence interval.

<sup>a</sup>Patients 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.

<sup>b</sup>Excludes PCPs who selected “none” (n = 2) in response to the question, “with how many of your at risk patients do you discuss physical activity?”

<sup>c</sup>Odds ratios adjusted for age group, sex, race/ethnicity, region, specialty, years in practice, main practice setting, privileges at teaching hospital, and financial situation of majority of patients. Odds ratios for reporting attitude and belief barriers also adjusted for reporting system-level barriers. Odds ratios for reporting system-level barriers also adjusted for reporting attitude and belief barriers.

<sup>d</sup>Attitude and belief barriers included PCPs who selected “I don’t know what to recommend,” “I don’t think counseling is effective,” or “patient won’t do it.” system-level barriers included PCPs who selected “referral services aren’t available,” “not enough time during visit,” or “insurance doesn’t cover it.” The prevalence of reporting both attitude and belief barriers and system-level barriers was 26.9%.