Practice-Level Approaches for Behavioral Counseling and Patient Health Behaviors

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Background: There is little empirical evidence to show that a practice-level approach that includes identifying patients in need of health behavior advice and linking them to counseling resources either in the practice or in the community results in improvements in patients' behaviors. This study examined whether patients in primary care practices that had practice-level approaches for physical activity and healthy-diet counseling were more likely to have healthier behaviors than patients in practices without practice-level approaches.

Methods: A cross-sectional study of 54 primary care practices was conducted from July 2005 to January 2007. Practices were categorized into four groups depending on whether they had both identification tools (health risk assessment, registry) and linking strategies (within practice or to community resources); identification tools but no linking strategies; linking strategies but no identification tools; or neither identification tools nor linking strategies.

Results: Controlling for patient and practice characteristics, practices that had both identification tools and linking strategies for physical activity counseling were 80% more likely (95% CI=1.25, 2.59) to have patients who reported exercising regularly compared to practices that lacked both. Also, practices that had either identification tools or linking strategies but not both were approximately 50% more likely to have patients who reported exercising regularly. The use of a greater number of practice-level approaches for physical activity counseling was associated with higher odds of patients' reporting exercising regularly (p for trend=0.0002). Use of identification tools and linking strategies for healthy-eating counseling was not associated with patients' reports of healthy diets.

Conclusions: This study suggests that practice-level approaches may enable primary care practices to help patients improve physical activity. However, these approaches may have different effects on different behaviors, and merit further research to determine if causal pathways exist and, if so, how they should be applied.

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Introduction

Health risk behaviors such as a sedentary lifestyle and unhealthy diet are major contributors to the leading causes of mortality and morbidity in the U.S.[1,2] Recent reports from the National Health Interview Survey and the Behavioral Risk Factor Surveillance Survey revealed that approximately 65% of adults in the U.S. did not exercise, and 76% had inadequate fruit and vegetable intake.[3–5] Sedentary lifestyle and unhealthy diet tend to co-occur in individuals and have been identified as risk factors for multiple chronic diseases.[3,6] Primary care is an important venue for addressing health behavior problems because of the high prevalence of patients with behavioral health needs seen in primary care practices[7,8]; however, many opportunities for counseling in primary care are missed due to limited resources, competing demands, and inadequate reimbursement.[9–12]

One model for providing high-quality preventive care in primary care practices involves brief clinician advice during the patient encounter combined with a referral to more-intensive behavior-change resources.[13,14] This model capitalizes on the strength of primary care (brief counseling), yet also recognizes the limitations of primary care (cannot do it all). This model may be most

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effective when practice-level strategies exist to identify patients in need of behavior change and to link those patients to counseling resources. Practice-level strategies—rather than reliance on individual clinicians—may be more likely to ensure that identification and referral occur on a regular basis.

Tools such as health risk assessments (HRAs) and registries are often used in primary care practices to identify and track patients with physical inactivity and unhealthy diets.[15] An HRA assesses an individual's current health and quality of life, and can help clinicians identify patients who are in need of health behavior advice.[15,16] A health behavior registry helps clinicians proactively track patients with unhealthy behaviors. Evidence suggests that the use of identification tools such as an HRA can help patients address and improve their physical activity and diet,[16,17] but it is not known whether a practice-level approach that includes identifying patients in need of health behavior advice as well as linking them to counseling resources in either the practice or the community results in actual improvements in the patients' behaviors. As a first step toward answering this question, this study assessed whether the patients of practices that had identification tools (HRAs, registries, or both) and strategies for linking patients to behavioral counseling resources were more likely to be physically active or to eat healthy than patients in practices that did not employ these tools and strategies.

Methods

Study Design

This study is a cross-sectional analysis of data collected from the Prescription for Health initiative, a national program funded by the Robert Wood Johnson Foundation in collaboration with the Agency for Healthcare Research and Quality. This initiative funded investigators from ten practice-based research networks (PBRNs) to implement innovative interventions to improve unhealthy behaviors such as tobacco use, unhealthy diet, physical inactivity, and risky alcohol use among primary care patients. Physical inactivity and unhealthy diet were the behaviors of interest in the current research, as these are highly prevalent in the study population and are both related to obesity.

The study sample included 4707 adult patients enrolled from 55 practices participating across seven PBRNs. Of the ten PBRNs participating in Prescription for Health, data from one PBRN were not available at the time of this analysis, and two other PBRNs were excluded from the analysis—one because the patient population included primarily children and adolescents, and the other because information on key study variables was missing. Each PBRN collected common practice and patient data as part of its participation in Prescription for Health. Ethical approval for human subjects research was obtained from the IRBs of the University of Medicine and Dentistry of New Jersey and the University of Colorado Denver.

Measures

Consenting patients in practices enrolled in each PBRN completed a survey at baseline (August 2005–January 2007) inquiring about their physical activity and diet. There was variation in the modes of administration of the survey (e.g., paper versus electronic, aided versus unaided) across the different PBRNs because each PBRN had a different intervention, study design, and target population. Practice-level data were also obtained at baseline (November 2005–May 2006), using a practice information form (PIF). The PIF was a web-based survey completed for each practice by a PBRN researcher in consultation with key practice informants. This survey provided information on characteristics of the practices, including practice type (solo or group); ownership (clinician, hospital system, university system, or others); financial status during the prior year (loss, neither loss nor gain, gain); and practice size (number of full- and part-time clinicians and staff). The PIF also assessed a practice's approach to patients with unhealthy behaviors, including information about the tools used to identify and track patients with health behavior risks and the strategies used to link patients to behavioral counseling resources. This information is the basis of the independent variable for this study as described below.

Figure 1 provides an overview of the independent variable, which was whether or not a practice reported having a practice-level approach to help patients with behavioral counseling needs. Having a practice-level approach was defined as having both practice-level identification tools to discover and track patients with health behavior risks and practice-level linking strategies to connect patients to behavioral health counseling. Practices were categorized into four groups for analysis depending on whether they had (1) both identification tools and linking strategies, (2) identification tools but no linking strategies, (3) linking strategies but no identification tools, or (4) neither identification tools nor linking strategies.

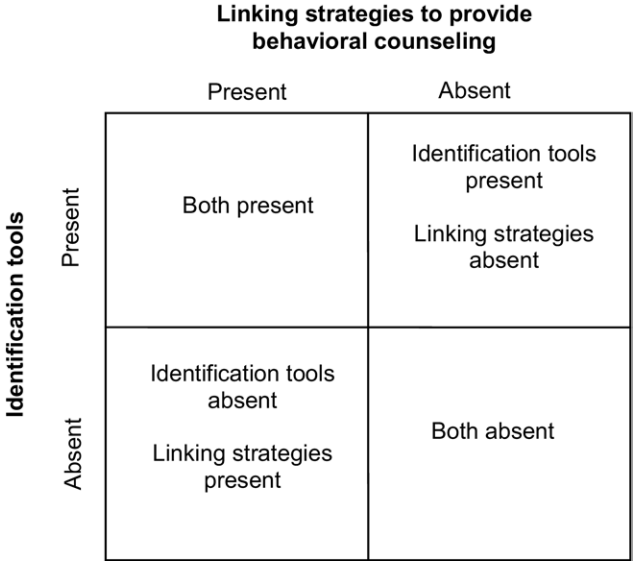

Figure 1. Overview of the independent variable (practice-level approach for behavioral counseling)

A practice was labeled as having practice-level identification tools if it had either an HRA or a registry for physical activity or diet. A practice was labeled as having practice-level linking strategies based on information derived from the Assessment of Chronic Illness Care (ACIC) survey.[18] The ACIC survey was originally developed from evidence-based studies to evaluate the implementation of the chronic care model in practice settings.[18,19] With the help of consultants, the authors adapted the ACIC survey to assess the practice-level linking strategies. In this adapted ACIC survey, two separate questions were asked about the presence of linking strategies to promote physical activity and a healthy diet, respectively. A practice was considered to have practice-level linking strategies if it referred patients to behavior-change classes; had affiliated behavior-change specialists (health educators, nutritionists) to whom patients were referred; had a staff person to ensure the maximum use of community resources or had coordination and feedback between the practice and community resources. Conversely, a practice was considered not to have practice-level linking strategies if it merely distributed information in the form of booklets and pamphlets or reported having only a list of community resources available for patients. For each practice, identification tools and linking strategies were assessed separately for physical activity and diet.

The outcome variables for this analysis were physical activity and healthy diet, both measured at the patient level. These measures were based on previous work by Glasgow et al.[20] Patients were considered to be physically active if they reported performing at least 30 minutes of moderate or vigorous physical activity 5 or more days per week, and patients were considered to have healthy diets if they reported eating five or more servings of fruits and vegetables on a typical day. Studies have demonstrated the validity and reliability of the physical activity[21] and diet measures[22,23] for use in primary care settings. The consumption of fruits and vegetables was used to measure diet because fruit and vegetable scores on a brief diet assessment tool correlated significantly with a longer 54-question dietary risk assessment.[23] In addition, in this sample of patients, the responses to questions about fruit and vegetable consumption correlated significantly with the overall diet score.

Additional practice-level variables included possible confounders (practice type and ownership, financial status of the practice, and the ratio of number of staff per each full-time equivalent clinician), as these were hypothesized to account for variations in organizational structure and size. Patient-level variables included age, gender, race/ethnicity, and education.

Statistical Analysis

Descriptive statistics were computed to describe the characteristics of patients and practices in this study. The structure of the data was hierarchical, with patients nested within practices and practices nested within PBRNs. Therefore, multilevel models with practice as a random effect were used to examine the association between the presence of identification tools and linking strategies for behavioral counseling and patients' physical activity and diet. This analysis was adjusted for potential patient and practice confounders. Because the outcome variables for these analyses were dichotomous, multilevel logistic regression modeling was used. Specifically, generalized estimating equations modeled log-odds of a patient's being physically active or eating a healthy diet as a function of practice- and patient-level covariates, using the GENMOD procedure within SAS/STAT version 9.1.3. To obtain stable estimates, the initial model adjusted for the clustering of patients within practices and included only patient-level covariates. In subsequent models, each practice-level covariate was added to the initial model and retained if $p<0.15$. The final model included all patient and practice covariates that had been tested in previous models and for the clustering of patients within practices.

Results

Primary care practice and patient characteristics are provided in Table 1. Single-specialty group practices and hospital system–owned practices were the most frequently observed practices in this sample. The average age of patients was 48 years, and almost 71% of the patients were women. A high percentage of patients

Table 1. Practice (N=55) and patient[a] (N=4707) characteristics

Characteristics	*n* (%)[a]
PRACTICE	
Type	
Solo	17 (30.9)
Single-specialty group	22 (40.0)
Multispecialty group	16 (29.1)
Practice ownership	
Clinician	17 (30.9)
Hospital system	22 (40.0)
University system	9 (16.4)
Public sponsor	4 (7.3)
Other	3 (5.4)
Financial status during past year	
Loss	39 (70.1)
No change	9 (16.4)
Gain	7 (12.7)
Number of staff per FTE clinician, M (SD)	3.81 (1.75)
PATIENT[a]	
Age (years), M (SD)	47.7 (9.43)
Gender	
Male	1313 (27.9)
Female	3355 (71.3)
Race/ethnicity	
Non-Hispanic white	2627 (55.8)
Non-Hispanic black	774 (16.4)
Hispanic	913 (19.4)
Other	226 (4.8)
Education	
<High school	2083 (44.2)
≥High school	2373 (50.4)
Annual household income ($)	
<25,000	1958 (41.6)
25,000–49,999	1028 (21.8)
≥50,000	1013 (21.5)

[a]Percentages may not add to 100% because of missing values.
FTE, full-time equivalent

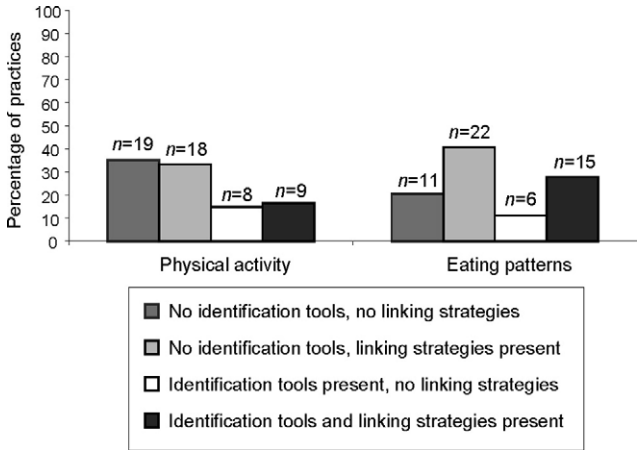

Figure 2. Practice-level use of identification tools and linking strategies for physical activity and healthy-diet counseling in primary care practices

were non-Hispanic white, had less than a high school education, and had an annual household income of <$25,000.

Figure 2 shows the distribution of practices by the presence of identification tools and linking strategies for physical activity and healthy diet counseling. Almost 35% (n=19) of practices lacked both identification tools and linking strategies for physical activity counseling. Similarly, 20% (n=11) lacked both for healthy diet counseling. Only 16% (n=9) of practices had both identification tools as well as linking strategies for physical activity counseling. For healthy diet counseling, a slightly higher percentage of practices (28%, n=15) had both identification tools and linking strategies.

Table 2 provides the percentage of patients who were physically active and consumed a healthy diet by presence of identification tools and linking strategies to provide behavioral counseling. These results were generated from hierarchical logistic regression models that included only the independent variable, thus providing unadjusted percentages after accounting for the hierarchical nature of the data. Overall, 30% (n=1430) of patients were physically active; only 8% (n=386) ate healthy diets. The percentage of patients who were physically active was lowest in practices that lacked both identification tools and linking strategies. The percentage was highest in practices that had identification tools but no linking strategies for physical activity counseling. The percentage of patients who reported consuming five or more servings of fruits and vegetables daily was not substantially different among practices regardless of the presence or absence of identification tools, linking strategies, or both.

Table 3 presents results from hierarchical logistic regression models for physical activity adjusted for patient and practice covariates. Practices that had both identification tools and linking strategies to provide physical activity counseling were 80% more likely to have patients who exercised regularly compared to practices that lacked both identification tools and linking strategies. Interestingly, practices that had either identification tools or linking strategies (but not both) were also significantly more likely to have patients who reported exercising regularly. In addition, group practices (single-specialty or multispecialty) compared to solo practices were less likely to report having patients who exercised regularly. Men and individuals with annual household incomes <$25,000 were also significantly less likely to report exercising regularly.

The ORs observed for the four categories of the independent variable appeared to follow a trend. Therefore, a practice's use of tools and linking strategies for physical activity counseling was also modeled as an ordinal variable to determine if this trend was significant. That analysis showed a significant trend in the odds of patients' reporting regular exercise with use of larger number of practice-level approaches for physical activity counseling (p-value for trend=0.0002).

Table 4 presents results for healthy diet adjusted for patient and practice covariates. Unlike physical activity, the practices' use of identification tools, linking strategies, or both to promote a healthy diet was not significantly associated with healthier diets among patients. Surprisingly, patients with less than a high school education and those belonging to the race category

Table 2. Patients' physical activity and diet by presence of practice-level strategies for behavioral counseling[a]

Practice strategies for behavioral counseling (n=54 practices)	Physically active[b] (n=4491 patients) % (CI)	Healthy diet[c] (n=4042 patients) % (CI)
No identification tools, no linking strategies	26.4 (22.0, 31.4)	7.6 (5.6, 10.3)
No identification tools but linking strategies present	30.3 (25.7, 35.4)	8.7 (7.3, 10.2)
Identification tools present, no linking strategies	32.5 (30.0, 35.1)*	7.5 (5.2, 10.8)
Identification tools and linking strategies present	30.4 (25.2, 36.2)	8.9 (7.9, 10.0)

[a]Numbers represent average percentage (CI) of patients who were physically active and consumed a healthy diet adjusted only for clustering of patients within practices. No adjustment for patient- or practice-level variables.
[b]Physically active patients performed moderate to vigorous physical activity for at least 30 minutes a day for 5 or more days a week.
[c]Patients with a healthy diet consumed five or more servings of fruits and vegetables on a typical day.
*p=0.03

Table 3. AORs (95% CIs) for physical activity by practice-level approaches for behavioral counseling

Independent variables	AOR (95% CI) for regular physical activity
PATIENT CHARACTERISTICS	
Age	0.98 (0.97, 0.99)
Gender	
Male	ref
Female	1.40 (1.18, 1.67)
Race	
Non-Hispanic white	ref
Non-Hispanic black	0.78 (0.59, 1.03)
Hispanic	1.12 (0.81, 1.55)
Other	0.90 (0.66, 1.24)
Education	
≥High school	ref
<High school	0.83 (0.66, 1.05)
Annual household income ($)	
≥50,000	ref
25,000–49,999	0.75 (0.54, 1.04)
<25,000	0.68 (0.55, 0.84)
PRACTICE CHARACTERISTICS	
Type	
Solo	ref
Single-specialty group	0.73 (0.58, 0.93)
Multispecialty group	0.55 (0.40, 0.77)
Number of staff per FTE clinician	1.06 (1.00, 1.12)
Practice-level approaches for behavioral counseling	
No identification tools, no linking strategies	ref
No identification tools but linking strategies present	1.48 (1.08, 2.02)
Identification tools present, no linking strategies	1.50 (1.05, 2.12)
Identification tools and linking strategies present	1.80 (1.25, 2.59)

FTE, full-time equivalent

Other were significantly more likely to have healthy diets, while—as expected—patients with lower annual household incomes were less likely to report healthy diets. None of the practice characteristics was significantly associated in bivariate analyses, and therefore those characteristics were not included in the final model.

Discussion

The excess morbidity and mortality attributed to a sedentary lifestyle and unhealthy diet continue to be a national crisis[2]; however, the role of the primary care office in combating this trend remains unclear. Despite a thorough review of available studies, the U.S. Preventive Services Task Force (the Task Force) has not found conclusive evidence to demonstrate that physical activity counseling in primary care leads to a sustained increase in physical activity; this highlights the need for more research regarding the use of primary care office systems to improve the assessment of health behaviors.[24] Nevertheless, several studies have suggested that implementing a practice-level approach to identify and assist patients in need for physical activity counseling may be an effective way to provide high-quality health behavior counseling in primary care.[7,12,14] Unlike the recommendations for physical activity, the Task Force has found that in certain high-risk patients, there is evidence that "medium- to high-intensity counseling interventions can produce medium-to-large changes in average daily intake of core components of a healthy diet (including saturated fat, fiber, fruit, and vegetables)."[25]

A key finding of this study was that practices that had both identification tools and linking strategies for physical activity counseling were 80% more likely to have patients who reported exercising regularly compared to practices that had neither. Interestingly, the presence of either identification tools or linking strategies for physical activity counseling was also significantly associated with patients' reporting regular exercise. This was confirmed as a dose–response relationship when the four categories of practice-level approaches for physical activity counseling were tested for trend. This finding suggests that there may be some relatively simple approaches that practices can implement to help patients successfully engage in physical activity. Because a number of primary care practices in this study (35%) lacked either basic identification tools or linking strategies to provide physical activity counseling, this may be an area where important improvements can be made in care processes for providing behavioral counseling.

This study did not find similar associations between a practice's use of identification tools and linking strategies for healthy diet counseling and patients' reporting healthy diets. While this result seems counter to the Task Force's recommendations, more research is needed to fully understand this finding. The studies informing the Task Force's recommendations focused on high-risk patients,[25] so this study's results suggest that changing the diets of the range of patients seen in the typical practice setting may be more complex than just utilizing identification tools and implementing linking strategies to healthy-diet counseling resources. These findings suggest that different practice-level approaches as well as different methods of providing

Table 4. AORs (95% CIs) for diet by practice-level approaches for behavioral counseling

Independent variables	AOR (95% CI) of healthy eating patterns
PATIENT CHARACTERISTICS	
Age	1.01 (1.00, 1.02)
Gender	
Male	ref
Female	0.79 (0.62, 1.01)
Race	
Non-Hispanic white	ref
Non-Hispanic black	1.02 (0.75, 1.37)
Hispanic	0.93 (0.68, 1.27)
Other	1.86 (1.27, 2.74)
Education	
≥High school	ref
<High school	1.59 (1.17, 2.16)
Annual household income ($)	
≥50,000 or greater	ref
25,000–49,999	0.77 (0.59, 1.02)
>25,000	0.72 (0.53, 0.98)
PRACTICE-LEVEL APPROACHES FOR BEHAVIORAL COUNSELING	
No identification tools, no linking strategies	ref
No identification tools but linking strategies present	1.28 (0.83, 1.96)
Identification tools present, no linking strategies	0.94 (0.63, 1.42)
Identification tools and linking strategies present	1.26 (0.86, 1.83)

healthy-diet counseling may be needed to improve patients' diets.

The findings of this study should be viewed as preliminary and interpreted in the context of certain limitations. First, the associations reported here are based on cross-sectional data that preclude making causal inferences. Second, all practices participating in this study were members of PBRNs. These practices may not be representative of all primary care practices, although it is known that primary care practices in PBRNs have similarities to randomly selected practices.[26] Also, the percentage of patients who consumed five or more servings of fruits and vegetables per day was relatively small in this sample. This may have affected the power to show significant differences in patients' diets, and also may have contributed to the surprising finding that patients with less than a high school education were more likely to report healthy diets.

Implementing office systems such as registries and linking strategies may seem relatively straightforward. However, it is increasingly clear that simply disseminating recommendations or guidelines is insufficient to stimulate practice change. It appears to be especially challenging for practices to engage in activities that are not readily reimbursed even with evidence that such activities may result in improvements to the overall health of their patients and may favorably affect multiple diseases. To make systematic changes such as those studied here, practices need to have a champion to steward the process[27] and are likely to need some external motivation and facilitation. Given the multiple competing demands faced by primary care clinicians and practices, it may be time for professional societies, payers, employers, and state and federal governments to step up to provide resources for transforming primary care practices so that they can address the important unmet needs of their patients.

In conclusion, after controlling for patient and practice characteristics, practically achievable practice-level approaches were associated with increased physical activity by patients in primary care practices but not with healthier diets. Further research using qualitative and prospective methods is needed to better understand how practice-level approaches affect patients' health behaviors.

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