

Impact of Medicare Annual Wellness Visits on Uptake of Depression Screening

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Objective: Depression screening is a required part of an initial annual wellness visit (AWV), a benefit for Medicare Part B beneficiaries. It is uncertain whether AWVs will increase depression screening. This study assessed whether patients with an AWV were more likely to be screened for depression than those with a primary care visit.

Methods: A cross-sectional analysis of electronic health record data was conducted for 4,245 Medicare patients who had at least one primary care visit at one of 34 practices within a large multisite provider network between September 2010 and August 2012. Quota sampling was used so that half of the participants had an AWV and half had a randomly selected primary care visit during the study period (the index visit). Multilevel logistic regressions were used to determine whether patients with an AWV had increased odds of depression screening compared with

patients with a primary care visit, after adjustment for physician and clinic clustering.

Results: Fifteen percent of patients with non-AWVs and 10% of patients with AWVs received depression screening. After accounting for clustering, there was no statistically significant difference in depression screening by visit type. There was a strong site effect, with one site conducting screening during 78% of AWVs and 82% of non-AWVs. Six sites screened none of their patients.

Conclusions: Overall, depression screening during the index AWV was uncommon. By itself, the AWV benefit does not appear to be a strong enough incentive to increase depression screening.

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Depression is one of the most prevalent mental disorders, affecting one in six older adults in the United States (1). Depressed older adults tend to have poorer functional status (2) and utilize more health care resources than non-depressed older adults (3). Furthermore, depression is a major contributing factor to the higher rate of suicide among older adults compared with middle-aged adults (4). Although many patients receive care for depression from primary care clinicians, past research indicates that clinicians are more likely to attend to patients' general medical health before addressing their mental health (5). This issue is particularly relevant with regard to depression because depression is known to co-occur with general medical illnesses (6), which may compete for clinicians' time and attention.

Given that depression often goes unrecognized in primary care, the U.S. Preventive Services Task Force recommends conducting depression screening for adults if there are sufficient staff supports (7). However, uptake of depression screening in primary care has been low (8). This may reflect beliefs that assessment and management of general medical problems should take precedence over depression screening, concerns about providing follow-up care

for patients who screen positive for depression (9), and uncertainty about whether depression screening alone improves outcomes (10).

In an effort to increase the rates of depression screening in primary care, Medicare included depression screening as a required component of each patient's initial annual wellness visit (AWV). This benefit, instituted in 2011, allows time to "develop or update a personalized prevention plan" (11). In order to encourage uptake, these visits are reimbursed at a higher revenue-value unit rate (12). It remains uncertain whether having an AWV increases the likelihood of depression screening. In this cross-sectional study, we assessed whether having an AWV was associated with increased odds of depression screening in primary care after the analyses adjusted for patient factors and clustering at the physician and clinic levels.

METHODS

Study Population

The study was based on retrospectively collected electronic health record (EHR) data from 5,000 Medicare-covered patients of 198 physicians working in a system including 34

primary care practices throughout Maryland and Washington, D.C. Patients with a visit between September 2010 and August 2012 were eligible for the study. Physicians were internal medicine or family medicine providers. Quota sampling was used so that approximately half of the patients had an AWV as their identified visit (index visit) and half of the patients had a non-AWV primary care visit as the index visit. Of the index visits that were not AWVs, 48% were for chronic care, 32% for preventive care, and 20% for other reasons. One hundred and forty-five individuals with a “Welcome to Medicare” visit as their index visit were excluded from the group with non-AWV index visits, given that the “Welcome to Medicare” benefit includes preventive care screenings that are similar to, but not the same as, the AWV benefit (13). All individuals with an active diagnosis of depression prior to the index visit were excluded, given that AWVs require the use of a screening instrument only for persons without a current diagnosis of depression (11,12). Individuals with Alzheimer’s disease were not excluded from the sample. An additional three patients were excluded because their index visit clinician was a podiatrist or an acupuncturist, leaving a final sample size of 4,245.

Data Collection

Clinicians used General Electronic Health’s Centricity EHR system, which was implemented in 2007. This EHR system is designed for ambulatory office settings and can interface with practice management systems. Data on the use of the depression module of the Patient Health Questionnaire (PHQ), a validated patient-reported depression screening tool (14), were collected from structured observation fields in the EHR. The PHQ is the only depression screener available in the EHR. Clinicians ask the first two questions on the PHQ (PHQ-2), which assess the two main symptoms of major depression in *DSM-IV* (depressed mood and anhedonia). If the patient responds positively to any one of these questions, the clinician continues to the longer PHQ-9 questionnaire, which includes questions assessing all nine major depression criteria in *DSM-IV*. For clarity, the term PHQ-9 is used throughout this article to refer to both the PHQ-2 and the PHQ-9.

Dependent Variable

The dependent variable was receipt of PHQ-9 screening during the index visit.

Independent Variable

The type of index visit, AWV versus non-AWV, was the independent variable of interest. Elements of the AWV include acquiring the patient’s history through a health risk assessment, establishing general medical and family history, and reviewing the patient’s risk factors for depression, including current or past experiences with depression. The AWV also includes assessment of the patient’s height and weight, identifying the patient’s care team, and detecting any cognitive impairment. Finally, the clinician should counsel the patient by providing health advice and referrals as

appropriate, determine a written schedule of screenings, and identify risk factors and conditions for which primary, secondary, or tertiary interventions are recommended (12). AWVs were defined by using visit billing codes in the EHR (13).

Covariates

Patient-level covariates for the analyses included demographic characteristics (age, race, and sex) and the patient’s active diagnoses. For patients who were 90 years or older, age was recoded as 90 to protect the confidentiality of the oldest old. The interaction of sex and age was included, given that older women are more likely to experience depression, but suicide is more prevalent among white men over 85 years old (15).

Diagnoses were obtained from the patient’s full problem list by using *ICD-9* codes and were determined to be active if the diagnosis date was earlier than the date of the index visit and if there was no stop date or if the stop date was later than the date of the index visit. Four representative diagnoses known to be prevalent and strongly associated with depression were included in the analyses: cancer, diabetes, hypertension, and Alzheimer’s dementia. Hypertension, diabetes, and cancer were included because of their known relationship with depression among older adults (16,17). Alzheimer’s dementia was included because patients with dementia may have a decreased ability to complete patient-reported outcome measures, such as the PHQ-9.

Multimorbidity was also included as a covariate in the analyses because it has been shown to be associated with depression (18). Multimorbidity was defined as having two or more active diagnoses for the following common chronic conditions: hyperlipidemia, hypertension, rheumatoid arthritis, diabetes, ischemic heart disease, chronic kidney disease, depression, osteoporosis, chronic obstructive pulmonary disorder, cancer, asthma, atrial fibrillation, stroke, and heart failure. All diagnoses were based on *ICD-9* code definitions from the Centers for Medicare and Medicaid Services Chronic Conditions Data Warehouse (19).

Analysis

The association of index visit type with depression screening was examined with multivariable logistic regressions. A stepwise approach to analyses was adopted, in which patient-level variables were added to the model one by one to adjust for potential confounding. Clustered-hierarchical models, as implemented in STATA *xtmelogit*, were used to take into account clustering at physician and clinic levels. An identity covariance structure assuming equal variances for all random effects at both the physician and the site level was used (20). Output is reported in odds ratios (ORs). Intraclass correlation within physician and within physician and clinic site is reported for models that controlled for physician and site clustering.

Models were compared by using Akaike information criterion (AIC), Bayesian information criterion (BIC), and McFadden’s adjusted R^2 at the patient level and by using log-likelihood ratios at all levels. Sensitivity analysis was conducted

by rerunning the multivariable regressions to assess the impact of inclusion of site 34, the only site with a very high screening rate, on the odds of depression screening. All analyses were conducted by using Stata, version 12.0.

This study was deemed not to be human subjects research by the Johns Hopkins Bloomberg School of Public Health Institutional Research Board.

RESULTS

The study participants' mean $\pm$ SD age was 74 ± 7 years; 62% were white, 59% were female, and 50% had at least one AWV. Type of visit differed by race but not by age or sex (Table 1). In total, 526 patients (12%) had a depression screen during the index visit. Receipt of depression screening during the index visit did not differ by sex ($N=214$, 12%, for males, and $N=312$, 12%, for females). However, blacks were more likely than whites to be screened ($N=368$, 26%, versus $N=153$, 6%, $p<.01$). On average, patients who were screened for depression were significantly older than patients who were not screened (75 ± 7 versus 74 ± 7 , $p=.01$). Adults with a non-AWV were more likely to be screened for depression compared with those with an AWV ($N=315$, 15%, versus $N=211$, 10%, $p<.01$).

Multivariable Logistic Regression Analyses

The regression model that controlled for age, sex, and race had the best fit and the smallest AIC and BIC on the patient level (21). Adding health status variables did not improve the fit of the model, as assessed by using likelihood-ratio tests.

In a multivariable logistic regression not accounting for clustering by clinician, the OR for depression screening during the index visit changed with the inclusion of patient-level covariates. Specifically, after the analyses controlled for race, age, and sex, the OR for depression screening during an AWV changed from .64 to 1.30 (Table 2). In addition, blacks had significantly higher odds of depression screening compared with whites in the multivariable model before it was adjusted for clustering ($OR=6.47$).

After accounting for clustering at the physician and at the physician-and-site level, patients with AWVs were not significantly more likely to receive depression screening than patients with non-AWVs. In addition, the racial difference in screening disappeared after the analyses adjusted for physician clustering. The intraclass correlation, which can be interpreted as the proportion of the variance in depression screening explained

TABLE 1. Demographic characteristics of study participants, by type of index visit

Characteristic	Total (N=4,245)		AWV (N=2,115) ^a		Non-AWV (N=2,130)		p
	N	%	N	%	N	%	
Age							.76
65–74	2,577	61	1,279	60	1,298	61	
≥ 75	1,668	39	836	40	832	39	
Female	2,524	59	1,258	59	1,266	59	.98
Race							<.001
White	2,616	62	1,612	76	1,004	47	
Black	1,432	33	353	17	1,079	51	
Other	197	5	150	7	47	2	

^a AWV, annual wellness visit

by differences among physicians, was very strong (.85), indicating the need to account for this source of variance by using multilevel models.

Site factors accounted for part of the variance between physicians in depression screening. Adjusting for site correlation decreased the within-physician intraclass correlation from approximately .85 to .45. The association of patient-level factors and depression screening was similar regardless of whether the model accounted for physician clustering or site-and-physician clustering (Table 2).

Depression Screening by Site

When depression screening by visit type was broken out by site (Figure 1), a clear association between site and depression screening was found, with site 34 screening 79% of AWVs and 82% of non-AWVs within its site. Six sites did not screen for depression during any of the index visits, despite the fact that each had seen over 100 patients included in the study.

Sensitivity Analysis

In a sensitivity analysis, site 34 was found to have an important impact on the overall odds of depression screening.

TABLE 2. Odds of depression screening during an annual wellness visit (AWV), by patient characteristics

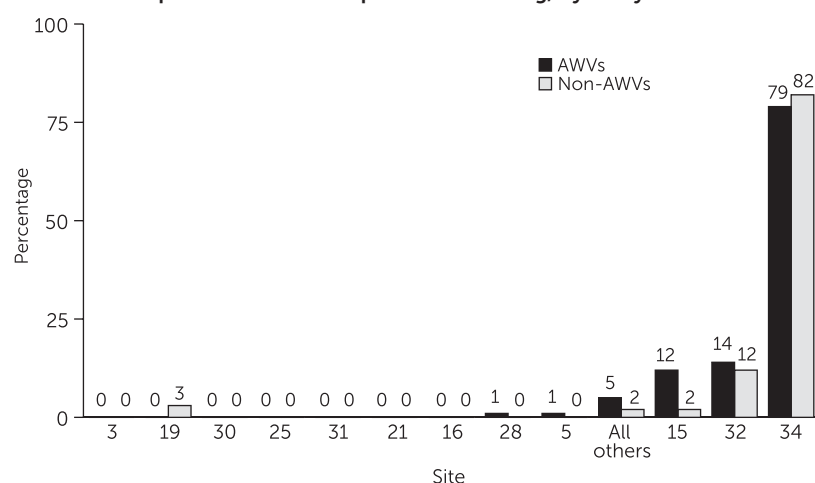
Variable	Model without clustering				Model with clustering			
	OR	95% CI	AOR ^c	95% CI	Physician level ^a	95% CI	Physician and site level ^b	95% CI
AWV (reference: non-AWV)	.64**	.53–.77	1.30*	1.05–1.60	1.30	.84–2.00	1.30	.84–2.01
Female (reference: male)	.99	.82–1.20	.83	.68–1.01	1.21	.86–1.72	1.22	.86–1.72
Age ≥ 75 (reference: <75)	1.35**	1.12–1.62	1.54**	1.27–1.87	1.40	.99–1.96	1.40	.99–1.97
Race (reference: white)								
Black	5.57**	4.55–6.81	6.47**	5.19–9.07	1.04	.66–1.65	1.03	.65–1.64
Other	.42	.17–1.03	.41	.16–1.01	.31	.09–1.10	.31	.09–1.10

^a The intraclass correlation for depression screening within a particular physician is .85 (95% CI [CI]=.77–.91).

^b The intraclass correlation for depression screening within a particular physician is .45 (CI=.05–.93) and within a particular physician in a particular site is .86 (CI=.78–.92).

^c Adjusted OR (AOR) reflects adjustment for sex, age, and race.

* $p \leq .05$, ** $p \leq .01$

FIGURE 1. Percentage of annual wellness visits (AWVs) and non-AWV primary care visits in which patients received depression screening, by study site^a

^a Sites with ≥ 100 patients are shown individually. Sites with < 100 patients are grouped as "all others."

When only site 34 was analyzed, the odds of depression screening were lower for patients with AWVs compared with non-AWVs, after the analyses controlled for age, sex, and race (adjusted OR=.89). However, when the analysis excluded site 34 and controlled for age, sex, race, and site clustering, patients with AWVs had twofold greater odds of depression screening compared with patients with non-AWVs (Table 3).

DISCUSSION

This study found that overall rates of depression screening during AWVs were low (10%). A bivariable regression modeling the relationship between depression screening and visit type found that patients with non-AWVs had higher odds of being screened for depression than patients with AWVs. After adjustment for patient factors and clustering, the odds of depression screening for patients who had AWVs and patients who had other types of primary care visits were not significantly different. Screening for depression during a preventive care visit was strongly

TABLE 3. Odds of depression screening during the index visit at study site 34 and sites 1–33, by patient variable

Variable	Site 34 only		Sites 1–33	
	AOR ^a	95% CI	AOR ^b	95% CI
AWV (reference: non-AWV) ^c	.89	.57–1.38	2.15*	1.34–3.44
Female (reference: male)	1.14	.74–1.78	1.26	.81–1.99
Age ≥ 75 (reference: < 75)	1.49	.95–2.33	1.35	.86–2.11
Race (reference: white)				
Black	1.31	.76–2.25	.79	.42–1.47
Other	.36	.07–1.77	.24	.03–1.84

^a Adjusted OR (AOR) reflects adjustment for sex, age, and race.

^b AOR reflects adjustment for sex, age, race, and site clustering.

^c Annual wellness visit

* $p \leq .01$

associated with physician and practice site. Without accounting for these additional clustering factors, patient-level factors, such as race, would have appeared highly associated with the odds of depression screening.

Surprisingly, there was a very prominent association between depression screening and clinic site, despite the AWV benefit. One site screened 79% to 82% of patients during the index visit, irrespective of whether the visit was an AWV or other primary care visit, and six sites screened none of their patients. The intraclass correlation among physicians in the regression models was very strong (.85), implying that a clinician's propensity to screen was not affected by patient factors.

The findings suggest that simply providing patients with the opportunity to receive mental health preventive care through the AWV benefit is not sufficient to increase

screening rates. Depression screening may be neglected because of barriers in incorporating screening into routine practice (9). The sensitivity analysis found that the AWV benefit significantly increased the odds of depression screening among sites that had low overall screening rates (not site 34). However, as Figure 1 indicates, this effect was not uniform across all sites, and seven sites did not screen for depression during any AWVs. Policy initiatives aimed at increasing depression screening should consider exploring ways to improve uptake of routine screening as part of the AWV for older adults.

Medicare established the AWV benefit in January 2011 as a way to increase access to preventive care. The AWV was not intended to replace a patients' yearly physical examination but to provide time to discuss new or chronic medical conditions (22). Depression screening is explicitly included as an essential task during a patient's initial AWV (13). Because this study took place in 2011 and 2012, and patients cannot have two AWVs within 12 months of each other, we are confident that the sample included patients' initial AWVs. Other tasks included as part of the AWV are taking a patient's history through a health risk assessment, establishing medical and family history, measuring a patient's height and weight, identifying a patient's clinicians, and detecting any cognitive impairment. Clinicians may prioritize other tasks over depression screening, especially because previous work has found that clinicians are concerned about the validity of depression screening tools and prefer clinical judgment in determining whether a patient is depressed (23). There is also the possibility that patients refuse to be screened for depression because of the stigma associated with this diagnosis.

The U.S. Preventive Services Task Force recommends depression screening only when "staff-assisted depression care supports are in place," yet staff-assisted depression supports can be minimal, such as having a nurse notify

physicians of a patient's score (7). Conversely, the Canadian Task Force on Preventive Health Care does not recommend routine depression screening for adults (24). Furthermore, a systematic review found that screening for depression among older adults without "further care supports" is unlikely to improve depression outcomes (25). The mixed message from various practice guidelines and research, plus the need for sufficient screening supports, may have contributed to differences in screening rates among clinicians. Indeed, a qualitative study found that clinicians reported concerns about how to screen for depression and about the lack of options available if a patient were diagnosed as having depression (9). As shown in Figure 1, one practice site was the main contributor to depression screens in this sample, regardless of the type of visit. At this site, there was a clinician-leader with a strong belief in screening, who established a clinical workflow that supported routine depression screening.

Past research suggests that variations in the delivery of health care may be indicative of poor quality of care (26,27). Physicians face competing priorities when deciding which services to recommend. They often need to consider a patient's health care needs, organizational and financial barriers and facilitators, and mixed evidence regarding the effectiveness of elements of care (26). Recent work on clinic predictors of adopting a depression care improvement model in the U.S. Department of Veterans Affairs health system found that sites with poor communication among staff, fewer quality improvement processes, insufficient financial resources, and no psychologists or psychiatrists on staff had 40% to 62% reduced odds of adopting a depression care improvement model (28). Thus improving the quality of depression care may require organizational changes far beyond the financial incentives associated with AWVs.

There were several limitations to this study. First, we conducted a cross-sectional analysis, and therefore no strong inferences regarding causation can be made. Second, patients' chronic diseases were determined by using ICD-9 codes, which are sensitive to physicians' coding preferences. Third, the data did not include medication information, and therefore we could not assess changes to antidepressant medications. Other research suggests that depression screening is associated with increased prescription of antidepressants (29).

Fourth, the external generalizability of the study is limited because it was conducted in a single health care system in Maryland and Washington, D.C. Nevertheless, we found large variations in screening practices even within this one system. These variations in screening practice are likely not unique to this health care system and would be found in other health care systems nationally. Finally, this study occurred during the first 20 months of the AWV benefit, and depression screening during AWVs may have increased since that time. Notably, the study identified strong clinician-level and site-level effects, which could be accounted for only by using multilevel models. This study's ability to account for

clustering within both clinicians and sites was a major strength of this work. However, future work should identify which clinic characteristics or processes are determinants of depression screening during AWVs.

CONCLUSIONS

The findings indicate that requiring screening as part of a Medicare benefit is not a strong enough incentive to overcome institutional and practice-style barriers to depression screening. Further work should be conducted to identify which practice characteristics promote appropriate depression screening and facilitate compliance with Medicare's AWV benefit. Identifying the factors that promote or hinder screening is particularly important, given the identification of a wide variation in depression screening among sites within a single health care system. Finally, the results suggest that efforts to design interventions to increase screening for specific patient groups should begin by carefully evaluating usual patterns of care, including preexisting, practice-style variations across clinicians and sites. These practice-style patterns may provide clues about the best approach to incentivize and promote a new initiative.

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