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Visits for Depression to Physician Assistants and Nurse Practitioners in the US

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Introduction

Major depression is a major public health problem. In 2015, approximately 16 million US adults experienced a major depressive episode.[1] Depression adversely affects physical health[2] and functioning.[3,4] The disease is recognized globally as a leading cause of disability.[5] Available research has shown that existing pharmacotherapy and psychotherapy treatments can effectively treat symptoms for many adults with depression.[6,7] However, a large proportion of adults are undertreated[8] or overtreated[9] for depression. Moreover, racial and ethnic disparities in the undertreatment of depression persist.[10,11] One strategy for improving the quality and equity of depression care is by ensuring access to a consistent source of care for individuals with depression. Having a usual source of

care is associated with an increased likelihood of receiving adequate depression treatment[12] and timely preventive services.[13] A worsening physician shortage, coupled with the increased demand for health services due to the aging population and the implementation of the Affordable Care Act, presents a challenge for providing access to depression treatment.[14] As the US experiences constraints in access to medical providers, there is a need to examine alternative models for delivering high-quality and clinically appropriate behavioral healthcare.

Since their introduction in the 1960s, physician assistants (PAs) and nurse practitioners (NPs) have increasingly improved access to health services and decrease healthcare costs.[15] According to the Bureau of Labor Statistics, in 2016 there were approximately 104,050 PAs and 150,230 NPs that were clinically active in the US.[16,17] As members of the healthcare team, PAs and NPs are assuming responsibilities and performing clinical duties that would otherwise be provided by a physician. Additionally, they are providing care that would otherwise not be available, especially in primary care.[18] Understanding how PAs and NPs deliver health services during clinical encounters for mental illnesses is essential for developing workforce initiatives and policies aimed at increasing access to behavioral healthcare.

Populations with chronic physical conditions served by PAs, NPs, and physicians are often similar but may differ on select sociodemographic and health status factors. Specifically, women and the uninsured are more likely to visit PAs and NPs,[19–21] while older patients[22,23] and those requiring more complex care[24] are more likely to visit physicians. However, mental health visits to PAs and NPs remains poorly understood. Using data from providers in the Veterans Administration healthcare system, Chang et al.[25] found that PAs, NPs, and physicians possessed similar attitudes towards depression care. Among geriatric patients, Ganz et al.[26] and Ruben et al.[27] have demonstrated that the quality of care provided by NPs co-managing depression was equivalent to that provided by physicians. Although these studies provide information about the depression management behaviors of PAs and NPs, they focused on select populations such as older adults and veterans and. Therefore, these findings are limited in their ability to inform national policies for all adults. To date little is known about the characteristics associated with adult mental health visits to PAs and NPs on a national level. This study sought to address this gap in the literature by using two national datasets to describe the number of visits to PA/NP for depression and to identify the factors associated with adult depression visits to PAs and NPs in the ambulatory care setting.

Methods

Study design, population, and data sources

This study is a secondary analysis of data from the National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS). The NAMCS collects information from a national probability sample of non-federal, office-based visits; the NHAMCS collects data from a national probability sample of visits to emergency and outpatient departments (OPD) of noninstitutional general and short-stay hospitals in the United States. Both surveys are conducted annually by the National Center for Health Statistics (NCHS), a division of the Centers for Disease Control and Prevention. The NAMCS is a probability sample of physicians, as opposed to all providers, and the NHAMCS is a probability sample of clinicians in OPDs. These surveys are among the few with detailed national health patient encounter (i.e. visit level) information that permit PAs and NPs to be categorized separately from physicians.[28,29] Complete data from the 2005–2011 NAMCS and the 2005–2011 NHAMCS OPD were pooled through a public use linkage file. The strategy of combining physician

office and OPD data to obtain a better understanding of patient characteristics and provider types has been established in the literature.[30,31] Detailed methodology and a description of the NAMCS and NHAMCS are available athttp://www.cdc.gov/nchs/ahcd/ahcd_questionnaires.htm.[32]

The sample for this study included 39,298 unweighted adult depression visits to three medical providers over seven years. For each visit, NAMCS and NHAMCS recorded a primary diagnosis and up to two other diagnoses related to the visit. Adult depression visits were identified as a visit by a patient 18 years and older with an *International Classification of Diseases, Ninth Revision* (ICD-9) code of 296.2, 296.3, 298.0, 300.4, 309.0, 309.1 or 311 as one of the three visit diagnoses. Visits with a positive response to the survey question "Regardless of the diagnoses previously entered, does the patient now have depression"[33] were also included. Visits were excluded if patients had not seen a physician, PA, or NP. We were unable to address the possibility of repeat visits as the NAMCS and NHAMCS do not include unique identifiersfor patients. Therefore, we assume that the visits are independent. Given the public availability of the data set and omission of identifying variables, this study was determined to be exempt from review by the Marquette University Institutional Review Board.

Outcome variable

PA/NP involvement in visit.

The level of PA and/or NP involvement in ambulatory care visits was determined by using a list of all providers seen at each visit. Three visit types were characterized: (1) no PA/NP (i.e. physician-only), (2) PA/NP-only (i.e. no physician), and (3) combined care (PA/NP and physician). Although PAs and NPs differ in their professional philosophies and training, the scope of services they deliver in healthcare settings is often equivalent.[15,34] To obtain robust estimates, PAs and NPs were combined into a singular provider type, consistent with research where the sample size is not large enough to report on each type of provider.[22,35]

Explanatory variables

Explanatory variables were based on the Andersen Behavioral Model, which characterizes the determinants of healthcare utilization and outcomes as need, enabling, and predisposing factors.[36] Predisposing characteristics included patient age (18–24, 25–44, 45–64, 65+ years), gender, race and ethnicity (Hispanic, white [non-Hispanic], black [non-Hispanic], and other [non-Hispanic]), region of the United States (West, Northeast, Midwest, and South), and urbanicity (categorized as urban and rural, as defined by Metropolitan Statistical Area [MSA] status). Health insurance status, an enabling factor, was grouped in the following mutually exclusive categories: no health insurance, any publicly funded health insurance (Medicaid and/or Medicare), and private health insurance only. Need factors included in the analyses were: number of chronic medical conditions, setting type (NAMCS or OPD), and major reason for the visit. Chronic medical conditions were identified using truncated three-digit ICD-9 codes, representing a diagnosis of cardiovascular disease, myocardial infarction, congestive heart failure, peripheral vascular disease, chronic obstructive pulmonary disease, diabetes mellitus, rheumatologic disease, peptic ulcer disease, liver disease, hemiplegia, renal disease, cancer, or AIDS. Available responses for the reason for the visit in the NAMCS and OPD included a new problem (i.e. onset within three months), routine care for a chronic problem (i.e. a condition with an onset of three months or more before the visit), exacerbation or flare-up of a chronic condition, pre- or post- surgery visit, and preventive care. For the analyses, reason for visit was categorized into three groups: new problem, chronic (i.e. routine or flare-up), or pre/post-surgery and preventive care.

Statistical analyses

SAS 9.3[37] was used to construct the analytic files, and STATA 13[38] was used to perform all analyses, accounting for the complex design of the NAMCS and NHAMCS. The standard errors were corrected due to clustering within strata and the primary sampling unit. Survey weights were applied to produce estimates that accounted for the complex survey design, unequal probabilities of selection, and survey non-response. Reported estimates were assessed for reliability using the NCHS's guidelines. NCHS considers an estimate to be reliable if the relative standard error is less than 30% and there are at least 30 unweighted observations.[39]

Descriptive analysis

Chi-squared analyses were used to test for differences in the explanatory variables by the level of PA/NP involvement in the visit.

Multivariate analysis.

A multinomial regression model was fit to estimate the relationship between the predisposing, enabling, and need factors and the level of PA/NP involvement in the visit. All variables were simultaneously entered into the model. To gain greater insight into the relationships between a patient's race and ethnicity, his or her insurance status, and the likelihood of seeing a PA/NP exclusively in depression visits over time, two separate regression models were used to test interactions between these covariates and the survey year.

Results

Overall, 11.0% of (39,298 unweighted, 6,858,997,344 weighted) ambulatory visits in the US (2005–2011) were for patients with depression. Among depression visits, 93.3% were physician-only (i.e., did not identify a PA/NP), 2.9% involved only a PA/NP (i.e. no physician), and 3.9% were combined care visits (i.e. involved both a PA/NP and a physician).

Significant differences were found in the level of PA/NP involvement in visits by patient sociodemographic and health characteristics (Table 1). Compared to physician-only visits, those with only a PA/NP were more likely to be for patients younger than 45 years old or for those with a new medical problem. Visits occurring in the Northeast or Midwest region, or in a rural area were also more likely to involve only a PA/NP. Among visits using public insurance, significantly more were seen exclusively by a PA/NP.

Table 1 Characteristics of Adult Visits for Depression by Physician Assistant or Nurse Practitioner Involvement, 2005–2011 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey Outpatient Departments

	PA/NP Level of Involvement			
	No PA/NP (Physician Only)	PA/NP only (No physician)	Combined (PA/NP and physician)	
Unweighted N (in visits)	35,273	2,519	1,506	
Weighted N (in visits)	6,816,443,279	18,104,522	24,449,543	
%	93.3	2.9	3.9	
Percent distribution (%)				p-value

Predisposing factors				
Patient age				<.0001
18–24	5.4	7.7	3.5	
25–44	28.2	36.9	24.0	
45–64	43.3	40.1	43.4	
65+	23.1	15.3	29.0	
Patient sex				0.1982
Male	29.9	26.2	31.9	
Female	70.1	73.8	68.1	
Patient race/ethnicity				0.1186
White, non-Hispanic	81.9	82.5	75.7	
Black, non-Hispanic	7.2	7.2	11.0	
Hispanic	8.2	9.0	10.5	
Other, non-Hispanic	2.7	1.3	2.8 [‡]	
Geographic region				0.0185
Northeast	22.0	34.0	22.7	
Midwest	24.0	27.1	19.0	
South	33.8	28.8	46.5	
West	20.2	10.1	11.8 [‡]	
Urbanicity (MSA)				
Non-MSA	15.0	30.8 [‡]	9.2 [‡]	0.0005
MSA	85.0	69.2	90.8	
Enabling factors				
Insurance				0.0005
Private	48.7	37.9	50.8	
Public	39.5	48.9	41.5	
Uninsured	11.8	13.1	7.6	
Need factors				
Number of chronic conditions				0.0073
0	81.1	82.5	74.9	
1	16.4	15.7	21.9	
2+	2.5	1.8	3.2	
Major reason for visit				<.0001
New problem	24.6	35.7	24.6	
Chronic, routine or flare-up	60.9	50.1	53.6	
Pre/post surgery or preventive care	14.5	14.1	21.8	
Setting type				<.0001
NAMCS	91.6	41.2	90.7	
OPD	8.4	58.8	9.3	

PA=Physician Assistant; NP=Nurse Practitioner; MSA=Metropolitan Statistical Area; No PA/NP=Physician Only Visit; PA/NP only=No Physician; Combined=PA/NP and Physician;

NAMCS=National Ambulatory Medical Care Survey; OPD=National Hospital Ambulatory Medical Care Survey Outpatient Departments

[‡]Estimate does not meet the National Center for Health Statistics criteria for reliability

The results from the regression model are presented using the Andersen Behavioral Model as a framework.

Predisposing factors

Table 2 results indicate that individuals 65 years and older with depression were less likely to see a PA/NP exclusively compared to those 25–44 years old (OR=0.54; 95% CI=0.40–0.73). And, they were more likely to have a combined care visit with both a PA/NP and a physician (OR=1.55; 95% 1.12–2.14). Black (non-Hispanic) adults with depression were less likely to see only a PA/NP (OR=0.56; 95% CI=0.38–0.84) and more likely to have a combined care visit (OR=1.58; 95% CI=1.16–2.14) compared to their white (non-Hispanic) counterparts. Those residing in urban areas were more likely to see only a PA/NP compared to their rural residing counterparts (OR=1.76; 95% CI=1.14–2.74).

Table 2 Adjusted Odds of Physician Assistant or Nurse Practitioner Involvement in Adult Visits for Depression in the USA0, 2005–2011

| | Dependent variable (ref.=No PA/NP (Physician only)) | | | |
| | PA/NP only (No physician) | | Combined care (PA/NP and physician) | |
Independent variables	OR	95% CI	OR	95% CI
Predisposing factors				
Patient age				
18–24	1.04	(0.68 – 1.58)	0.77	(0.44 – 1.33)
25–44	1.00		1.00	
45–64	0.75*	(0.60 – 0.94)	1.15	(0.94 – 1.41)
65+	0.54*	(0.40 – 0.73)	1.55*	(1.12 – 2.14)
Patient sex				
Male	1.00		1.00	
Female	1.15	(0.89 – 1.48)	0.86	(0.70 – 1.05)
Patient race/ethnicity				
White, non-Hispanic	1.00		1.00	
Black, non-Hispanic	0.56*	(0.38 – 0.84)	1.58*	(1.16 – 2.14)
Hispanic	0.91	(0.48 – 1.74)	1.38	(0.81 – 2.36)
Other, non-Hispanic	0.50*	(0.30 – 0.83)	1.27	(0.48 – 3.37)
Geographic region				
Northeast	1.00		1.00	
Midwest	0.83	(0.44 – 1.55)	0.75	(0.39 – 1.44)
South	0.86	(0.45 – 1.67)	1.30	(0.61 – 2.74)

West	0.63	(0.31 – 1.31)	0.52	(0.23 – 1.15)
Urbanicity (MSA)				
Non-MSA	1.00		1.00	
MSA	1.76*	(1.14 – 2.74)	0.56	(0.27 – 1.16)
Enabling factors				
Insurance Status				
Private	1.00		1.00	
Public	1.26*	(1.05 – 1.52)	0.82	(0.63 – 1.07)
Uninsured	1.15	(0.86 – 1.54)	0.61*	(0.39 – 0.97)
Need factors				
Number of chronic conditions				
0	1.00		1.00	
1	0.97	(0.72 – 1.32)	1.34*	(1.02 – 1.75)
2+	0.84	(0.46 – 1.52)	1.28	(0.73 – 2.24)
Major reason for visit				
New problem	1.00		1.00	
Chronic, routine or flare-up	0.58*	(0.45 – 0.75)	0.84	(0.69 – 1.03)
Pre/post surgery or				
Preventive care	0.62*	(0.45 – 0.85)	1.50	(0.96 – 2.35)
Setting type				
NAMCS	1.00		1.00	
OPD	13.84*	(8.29 – 23.12)	1.12	(0.75 – 1.67)

*p<0.05
PA=Physician Assistant; NP=Nurse Practitioner; MSA=Metropolitan Statistical Area;
NAMCS=National Ambulatory Medical Care Survey; OPD=National Hospital Ambulatory Medical Care Survey Outpatient Departments

Enabling factors

The likelihood of seeing only a PA/NP did differ by insurance status such that compared to adults with private insurance, those with public insurance were more likely see a PA/NP exclusively (OR=1.26; 95% CI=1.05–1.52). Additionally, adults with no insurance were less likely to have a combined care visit than those with private insurance (OR=0.61; 95% CI=0.39–0.97).

Need factors

Individuals with a chronic disease were more likely to have a combined care visit than those without a chronic medical condition (OR=1.34; 95% CI=1.02–1.75). Visits for chronic, preventive, or pre-or post-surgical care were all less likely to be with only a PA/NP.

Interactions

Interactions between patient race and ethnicity and year were not statistically significant for seeing a PA/NP exclusively; this was also true for interactions between insurance status and year (results are not shown for either relationship).

Discussion

The study identifies that PAs and NPs were involved in about 7.0% of visits for depression and were the sole provider of record for 2.9% of all visits for depression. This is half the percentage of ambulatory care visits for chronic diseases managed by PAs and NPs in similar studies.[23] This suggests that PAs and NPs may be underutilized in the care of individuals with depression. Increasing visits for adults with depression managed by PAs and NPs could increase access to care, which may help to increase healthcare system efficiency. Emerging literature has shown that delegating care tasks from physicians to other providers can enhance the quality of care.[40]

Collaborative care management is a promising, evidence-based approach for improving depression outcomes[41,42] where depression care is managed by a clinician team consisting of a care manager, primary care provider, and a psychiatrist. The case manager monitors and documents treatment outcomes, provides patient education, encourages adherence, and facilitates medication changes and referrals. The primary care provider collaborates with the care manager and maintains overall clinical responsibility for the care delivered, while the psychiatrist is available to consult difficult cases.[43,44] Further research is needed to examine the feasibility, acceptability, and outcomes of PA- or NP-led collaborative care depression management teams.

This study also found that, compared to rural areas, depression visits in urban areas were more likely to be with PAs or NPs exclusively. While these findings strengthen the work of other researchers,[21] they are in contrast to previous research showing that individuals residing in rural areas are more likely to use PAs and NPs as a usual and longitudinal source of care.[19] The rural/urban difference in the type of provider involved in depression visits may be due to the increased complexity associated with managing depression in rural settings. Patients in rural environments are more likely to present with poorly defined symptoms.[45] Additionally, the culture of self-reliance and independence that is often valued in rural settings likely prevents some individuals from seeking care until their depression symptoms are severe enough to overwhelm their individual coping resources.[46] Furthermore, culturally-based concerns about mental health stigma and confidentiality may be of greater concern in rural environments[46] and may be a barrier to accepting mental healthcare provided by PAs or NPs. Understanding the attitudes and practices of PAs and NPs caring for patients with depression in rural settings maybe an important strategy for improving mental healthcare in these areas.

This study found that insurance status was associated with the use of PAs and NPs. In their 2015 study, Benitez and colleagues[21] demonstrated that physicians were more likely than PAs or NPs to serve as providers of care for medical visits compensated by private insurance or Medicare; yet, PAs and NPs were more likely to provide care for visits with other payment sources such as Medicaid, out-of-pocket funds, or pro bono sponsorship. The results of this investigation support a similar trend.

This study has several limitations. The use of cross-sectional data means the observed associations cannot be interpreted as causal. Although the NAMCS is an important national database, it only collects information from office-based visits and at the time of this study about 53% of primary care

physician offices reportedly employed PAs or NPs.[47] Another limitation of the NAMCS data is that if the physician has any contact with the patient, even when PA or NP was the principal provider of the visit, 100% of the billing can be made under the physician as the provider of record; thus, the encounter may be inaccurately classified as a physician-only encounter. Moreover, given that NAMCS samples physicians, it is likely that PAs and NPs who function more autonomously and have their own schedule of patients are underrepresented.[28] The impact of the limitations of the NAMCS were mitigated by including the NHAMCS. In the NHAMCS, the clinic is the destination of the patient and, thus, the visit is attributed to the clinician providing the service.[21,23]

Although the findings identified the characteristics of visits for depression attended by PAs and NPs, the treatment of depression was not examined. Evaluating the quality of depression assessment and treatment provided by PAs and NPs is the next suggested research. Finally, this analysis could not measure depression severity. However, a general measure of chronic medical conditions was included as a need factor.

This study has important strengths. First, the results are based on seven years of national data, providing policy makers and practitioners with a picture of patients with depression who receive care from PAs or NPs. Additionally, due to the important data present in the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey, several predictors of depression treatment could be investigated together in one model, allowing for adjusted estimates of the contributing effect of each characteristic.

Implications for Behavioral Health

This study has implications for workforce initiatives and policies aimed at increasing access to mental healthcare. Increased use of PAs and NPs on healthcare teams may be an overlooked strategy for ensuring continued access to depression care. There is potential for PAs and NPs to provide appropriate treatment based on a person's level of need, which could minimize both under and overtreatment. As such, PA- and NP-led collaborative depression care teams may be an effective intervention worth exploring. Prospective research should examine the feasibility, acceptability, and outcomes of PA- or NP-led collaborative care depression management teams, with special attention paid to the appropriateness of the care delivered. While the findings suggest that many of the characteristics associated with depression visits to PAs or NPs in the ambulatory care setting are similar to those for non-mental health visits, this study highlights the need for greater understanding of the attitudes and practices of PAs and NPs caring for patients with depression in rural settings.

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Footnotes

Work Conducted at Marquette University, Milwaukee WI

Conflicts of Interest Statement

None of the authors have a conflict of interest, financial or other, to report.

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