

POPULATIONS AT RISK

Receipt of Nutrition and Exercise Counseling Among Medical Outpatients with Psychiatric and Substance Use Disorders

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OBJECTIVE: Mentally ill persons represent a population that is potentially vulnerable to receiving a poorer quality of medical care. This study examines the relationship between mental disorders and the likelihood of receiving recommended nutrition and exercise counseling.

DESIGN: Cross-sectional study combining chart-review data and administrative database records.

SETTING: One hundred forty-seven Veterans Affairs (VA) medical centers nationwide.

PATIENTS/PARTICIPANTS: The sample included 90,240 patients with obesity and/or hypertension who had ≥ 3 medical outpatient visits in the previous year.

MEASUREMENTS AND MAIN RESULTS: The outcomes of interest were chart-documented receipt of nutrition counseling and receipt of exercise counseling in the past 2 years. This chart information was merged with VA inpatient and outpatient administrative databases, which were used to identify persons with diagnosed mental disorders. Most patients received nutrition counseling (90.4%), exercise counseling (88.5%), and counseling for both (85.7%) in the past 2 years. The rates of counseling differed significantly but modestly by mental health status. The lowest rates were found among patients dually diagnosed with comorbid psychiatric and substance use disorders; however, the magnitude of the disparities was small, ranging from 2% to 4% across outcomes. These results were unchanged after controlling for demographics, health status, and facility characteristics using multivariable generalized estimating equation modeling.

CONCLUSIONS: Among patients engaged in active medical treatment, rates of nutrition and exercise counseling were high at VA medical centers, and the diagnosis of mental illness was not a substantial barrier to such counseling. More work is needed to determine whether these findings generalize to non-

VA settings and to understand the potential role that integrated systems such as the VA can play in reducing disparities for vulnerable populations.

KEY WORDS: mental disorders; nutrition; exercise; counseling; patient education.

J GEN INTERN MED 2002;17:556-560.

Poor diet and physical inactivity are well-established risk factors for chronic disease morbidity and mortality.^{1,2} Studies suggest that counseling by primary care providers can play an important role in helping to bring about positive changes in patients' health behaviors.³⁻⁵ The U.S. Preventive Services Task Force recommends that clinicians counsel their patients regarding the role of proper nutrition and exercise in achieving and maintaining good health.⁶ Despite these recommendations, however, studies indicate that a substantial proportion of patients do not receive appropriate counseling.⁷⁻⁹ It is important to identify subgroups of patients who may be less likely to receive nutrition and exercise counseling, so that efforts to increase rates of counseling may be appropriately targeted.

Compared with the general population, patients with mental disorders have poorer health behaviors, including worse diet and lower rate of physical activity.¹⁰ In addition, the use of antipsychotics^{11,12} and antidepressants¹³ has been associated with substantial weight gain. Thus, people with mental illness represent a patient population for whom nutrition and exercise counseling may be particularly important. However, research suggests that mentally ill patients are potentially vulnerable to receiving a poorer quality of medical care than persons with no mental disorder,¹⁴⁻¹⁸ and generalists may have difficulty in addressing the medical needs of patients with substance use disorders in particular.^{19,20} This may be especially problematic with respect to counseling, which relies on effective patient-physician communication,²¹ since the cognitive, affective, and behavioral symptoms associated with mental illness may hinder such communication.^{22,23}

To date, no empirical studies have examined the association between mental disorders and the likelihood of receiving nutrition and exercise counseling. In the present study, we examined this relationship in a large national sample of medical outpatients receiving care at

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Department of Veterans Affairs (VA) medical centers. We hypothesized that, compared with patients with no mental illness, patients with psychiatric and/or substance use disorders are less likely to receive nutrition and exercise counseling, even after controlling for demographic characteristics, health status, and medical facility-level characteristics.

METHODS

Data Sources and Study Sample

The Veterans Health Administration (VHA), which provides care to approximately 3.5 million persons annually, is the largest fully integrated health care system in the United States.²⁴ As part of an effort to monitor the quality and appropriateness of care delivered at VA medical centers, the VHA established an External Peer Review Program (EPRP), which, on an ongoing basis, randomly selects and reviews medical records at all VHA facilities.²⁵ Data for this study were collected between January 1998 and December 1999. The overall EPRP sampling frame included patients with selected high-volume medical diagnoses—including ischemic heart disease, chronic obstructive pulmonary disease, diabetes mellitus, obesity, and hypertension—who had 3 or more medical outpatient visits in the previous year. For each medical condition, the EPRP monitors compliance with disease-specific quality indicators.²⁴

For this study, we focused on persons with obesity and/or hypertension ($N = 90,240$)—patients for whom the EPRP quality-of-care indicators concern nutrition and exercise counseling. Obesity was defined as body mass index (BMI) greater than 27 kg/m^2 . BMI was calculated using the most recent weight and height data in the medical record. Hypertensive patients were identified on the basis of a chart-documented clinician diagnosis of hypertension. Trained reviewers, blinded to the study hypothesis, abstracted paper and/or electronic records, looking for evidence of receipt of nutrition and exercise counseling in the past 2 years. Quarterly assessments of inter-rater reliability yielded Kappa values greater than 0.95.

Using social security number, the EPRP chart-review data were merged with 3 national VHA administrative databases (Patient Encounter File, Outpatient File, and Patient Treatment File). Taken together, these 3 files detail all outpatient and inpatient care received at VHA facilities. The administrative data were used to identify patients with mental health diagnoses treated at VHA facilities as well as to ascertain patients' demographic characteristics.

Measures

Outcome Variables. The outcomes of interest for the present study were receipt of nutrition counseling and receipt of exercise counseling in the past 2 years.²⁴ VA providers record counseling activities by checking items off

of counseling checklists or through notes made in the patient's chart. Chart-documented nutrition (including weight control) counseling encompassed a broad array of activities, ranging from discussing topics such as decreasing intake of fat and cholesterol, increasing intake of fruits and vegetables, maintaining calorie balance, and losing weight, to referring patients to nutrition and weight control classes. Exercise counseling included discussing topics such as the need to incorporate regular physical activity into one's daily routine, the benefits of regular physical activity, and methods for increasing physical activity. In addition, patients were regarded as having received exercise counseling if the clinician documented that they currently engage in appropriate exercise.

Mental Conditions. We used VHA inpatient and outpatient administrative database records for the year prior to the index date to identify persons with a diagnosed mental disorder (International Classification of Diseases [ICD]-9 codes 290–319). Because psychiatric and substance use disorders may represent independent risk factors for decreased quality of medical care,¹⁴ we categorized patients into 1 of 4 mutually exclusive diagnostic groups: no mental disorder; psychiatric disorder only (ICD-9 codes 290–302 and 306–319); substance (alcohol or drug) use disorder only (ICD-9 codes 303–305); or dual diagnosis (comorbid psychiatric and substance use disorders).

Control Variables. Multivariable analyses controlled for a variety of potential confounders that could explain any observed associations between mental illness and receipt of counseling. We classified potential confounders into 3 categories: demographic characteristics, health status, and facility characteristics. Demographic characteristics, obtained from administrative data, included age, sex, race/ethnicity (white, black, Hispanic, other), level of VA service connectedness (i.e., degree to which veteran has priority access to VHA care),²⁶ and distance from veteran's home to nearest VA medical center.²⁷ Because information on race was missing for a substantial proportion (22%) of patients, a dummy variable for missing race was included in all models. Health status was defined as the total number of medical conditions included in the EPRP data (possible range 1 to 5 conditions). Finally, we examined 3 medical facility-level variables: academic emphasis (defined as the proportion of funds spent on teaching and research); hospital size (defined as the total number of patients treated per year); and mental health emphasis (defined as the proportion of funds spent on mental health versus general health care).^{28,29}

Statistical Analysis

We calculated the proportion of patients with chart-documented receipt of nutrition counseling, exercise counseling, and counseling for both in the past 2 years. Overall

results and results stratified by mental health diagnostic category are presented. Bivariate associations between mental health status and the quality indicators were assessed using χ^2 tests.

We performed multivariable logistic regression analyses to examine the relationship between mental disorders and receipt of counseling, controlling for demographic characteristics, health status, and facility characteristics. Generalized estimating equation modeling was used to incorporate both individual-level and facility-level covariates and to account for the clustering of patients within facilities.³⁰ Because odds ratios may not provide accurate estimates of risk when the outcome of interest is relatively common, we calculated adjusted probabilities from odds ratios using the method described by Zhang and Yu.³¹ Initially, parallel analyses were performed separately for patients with obesity and patients with hypertension; however, nearly identical results were found for the 2 groups. Therefore, we present a single set of results for the combined sample. All analyses were performed using SAS software (version 6.12; SAS Institute, Inc., Cary, NC).

RESULTS

Table 1 presents a description of the sample ($N = 90,240$). Nearly one third of the sample had a diagnosed mental disorder (24.1% psychiatric disorder only, 1.8% substance use disorder only, and 3.4% dual diagnosis). In general, compared with those with no mental disorder, mentally ill patients were more likely to be younger, female (except those with a substance use disorder only), and non-

white. In addition, patients with a psychiatric disorder or dual diagnosis were more than twice as likely as those with no mental disorder to receive VA compensation for a $\geq 50\%$ service-connected disability; patients with a substance use disorder only were the least likely to be service connected. Moreover, persons with a mental disorder (particularly the dually diagnosed) lived closer to a VA medical facility; had fewer medical conditions; and tended to be treated at facilities that spend a greater proportion of funds on teaching and research, are larger in terms of annual patient volume, and spend a greater proportion on mental health versus general health care.

As shown in Table 2, the vast majority of patients received nutrition counseling (90.4%), exercise counseling (88.5%), and counseling for both (85.7%) in the past 2 years. In unadjusted analyses, the rates of counseling differed significantly but modestly by mental health status. The lowest rates were found among patients dually diagnosed with comorbid psychiatric and substance use disorders; however, the magnitude of the disparities was small, ranging from 2% to 4% across outcomes. These results were unchanged after controlling for demographics, health status, and facility characteristics (data not shown).

To determine whether the effect of mental health status on receipt of counseling varied according to type of facility (e.g., larger versus smaller facility), secondary analyses were conducted in which we modeled interaction terms between mental health diagnosis and facility characteristics. We did not observe a consistent pattern with respect to the interaction terms, suggesting that the relative lack of association between mental illness and nutrition and

Table 1. Description of the Sample by Mental Health Status*

Characteristic	Overall ($N = 90,240$)	Mental Health Status [†]			
		No Mental Disorder ($n = 63,837$)	Psychiatric Disorder Only ($n = 21,774$)	Substance Use Disorder Only ($n = 1,604$)	Dual Diagnosis ($n = 3,025$)
Demographics					
Age, y	64.4 ± 11.9	65.9 ± 11.3	61.5 ± 12.7	60.6 ± 11.1	54.3 ± 10.8
Male, n (%)	76,321 (84.6)	55,310 (86.6)	16,906 (77.6)	1,522 (94.9)	2,583 (85.4)
Race/ethnicity [‡] , n (%)					
White	56,748 (80.5)	39,174 (80.8)	14,762 (81.7)	894 (69.4)	1,918 (71.6)
Black	10,231 (14.5)	6,914 (14.3)	2,371 (13.1)	325 (25.2)	621 (23.2)
Hispanic	2,822 (4.0)	1,905 (3.9)	768 (4.2)	53 (4.1)	96 (3.6)
Other	725 (1.0)	494 (1.0)	172 (1.0)	16 (1.2)	43 (1.6)
VA service connection $\geq 50\%$, n (%)	14,298 (15.8)	7,559 (11.8)	5,888 (27.0)	115 (7.2)	736 (24.3)
Distance from home to nearest VA facility (miles)	24.2 ± 25.5	25.8 ± 26.5	23.5 ± 24.7	22.0 ± 26.2	17.7 ± 22.8
Health status					
Medical conditions	2.2 ± 0.8	2.2 ± 0.8	2.1 ± 0.8	2.1 ± 0.8	2.0 ± 0.8
VA facility characteristics					
% of funds spent on teaching and research	5.4 ± 4.1	5.3 ± 4.1	5.5 ± 4.1	5.7 ± 4.1	5.8 ± 4.2
Patients treated per year (in thousands), n	28.2 ± 14.1	28.1 ± 14.0	28.6 ± 14.3	27.8 ± 13.7	28.9 ± 14.7
% of funds spent on mental health care	12.8 ± 8.8	12.7 ± 8.7	13.2 ± 9.0	13.1 ± 8.8	14.2 ± 9.5

* Table values are mean ± standard deviation for continuous variables and n (%) for categorical variables.

[†] $P < .001$ for all comparisons (analysis of variance F test for continuous variables and χ^2 test for categorical variables).

[‡] Information on race missing for $n = 19,714$ (22%).

Table 2. Percent of Patients with Obesity and/or Hypertension Who Received Nutrition and Exercise Counseling in the Past 2 Years by Mental Health Status

Mental Health Status	Nutrition Counseling	Exercise Counseling	Counseling for Both
Overall	90.4	88.5	85.7
No mental disorder	90.4	88.7	86.0
Psychiatric disorder only	90.9	88.5	85.8
Substance use disorder only	89.6	86.3	83.2
Dual diagnosis	88.4	85.7	82.0
P for χ^2 test	.001	.001	.001

exercise counseling was fairly constant across facility types.

DISCUSSION

Among medical outpatients with obesity and/or hypertension receiving care at VA medical centers nationally, we found that the majority had received nutrition and exercise counseling in the past 2 years. Moreover, contrary to our hypothesis, we found little difference in rates of counseling between patients with and without mental disorders. A combination of system-level factors may have contributed both to the high rates of counseling and to the modest differences by mental health status observed in this study. First, the VHA's use of counseling checklists and electronic medical records is likely to promote greater delivery of preventive services. Second, counseling activities are likely reinforced by the regular feedback provided by the EPRP to VHA facility clinical leaders and administrators. Third, providing medical and mental health services at the same facility, the VHA is a fully integrated health care system geared toward caring for severely mentally ill patients, with approximately 20% of the general patient population having a mental disorder.²⁸ Given these factors, the results of this study may underestimate the differences in rates of counseling by mental health status in other health care settings.

This study had the following limitations. First, our ability to control for potential confounders such as race was limited by the quality of the available administrative data. Second, we did not have data on non-VA health services utilization. To the extent that some veterans likely received additional medical care in non-VA settings, we may have underestimated the proportion of patients who received nutrition and exercise counseling in the past 2 years. This underestimation, however, likely resulted in a biasing toward the null, since patients with no mental disorder may have been more likely to receive non-VA care, given, in part, their older age and increased Medicare eligibility.

Another limitation of this study was that our sample only included patients with 3 or more medical outpatient visits in the previous year, i.e., patients engaged in active medical treatment. Persons with mental disorders often

face substantial barriers to obtaining any medical care at all.³² For instance, nationally, among all VA patients with a substance use disorder and no psychiatric comorbidity, only 59% had a primary care visit and fewer than half (48%) had 3 or more medical visits during fiscal year 2000 (unpublished data). To the extent that use of medical services and, therefore, inclusion in the sampling frame likely varied between VA patients with and without mental disorders, the findings of this study should be interpreted conservatively: mental illness does not appear to be a substantial barrier to nutrition and exercise counseling as long as patients are consistent utilizers of medical services. This study does not address the degree to which patients with mental disorders experience barriers in access to care, although that is clearly an important subject for further research.

Finally, our outcome variables—receipt of any nutrition counseling and receipt of any exercise counseling in the past 2 years—were blunt measures of counseling activity. Given the available data, we were unable to examine more clinically salient measures, such as the frequency of counseling over the 2-year period and the effectiveness of the counseling received. According to data from the 1995–1996 National Ambulatory Medical Care Surveys, exercise counseling and diet counseling were provided in only 32.8% and 41.5%, respectively, of office visits by patients identified as obese.³³ It is important to remember, however, that success in altering patients' health behaviors may come in small increments and that repeated counseling may be necessary to affect long-term changes.³⁴

Future studies should seek to determine whether mental illness influences not only overall receipt of any counseling but also the intensity and the impact of health behavior counseling. Greater, more clinically significant disparities by mental health status might be observed for these more sensitive counseling outcomes, since the cognitive, affective, and behavioral symptoms associated with psychiatric and substance use disorders may hinder effective patient–physician communication as well as the ability of mentally ill patients to comply with recommended counseling.

In conclusion, we found that, among patients with obesity and/or hypertension who were consistent utilizers of VA medical services, the majority received nutrition and exercise counseling at least once in the past 2 years, and that the diagnosis of mental illness was not a substantial barrier to such counseling. More work is needed to determine whether these findings generalize to non-VA settings and to understand the potential role that integrated systems such as the VA can play in reducing disparities for vulnerable populations.

We wish to acknowledge the contributions of Thomas Craig, MD, and Steven Wright, PhD, who provided helpful comments on a previous draft, and of Dean Bross, PhD, who assisted in our use of the EPRP data.

This study was supported by the VA New England Mental Illness Research, Education, and Clinical Center.

REFERENCES

- Kuller LH. Dietary fat and chronic diseases: epidemiologic overview. *J Am Diet Assoc.* 1997;7:9S-15S.
- Wagner EH, LaCroix AZ, Buchner DM, Larson EB. Effects of physical activity on health status in older adults. I: Observational studies. *Annu Rev Public Health.* 1992;13:451-68.
- Long BJ, Calfas KJ, Wooten W, et al. A multisite field test of the acceptability of physical activity counseling in primary care: project PACE. *Am J Prev Med.* 1996;12:73-81.
- O'Connor PJ, Rush WA, Prochaska JO, Pronk NP, Boyle RG. Professional advice and readiness to change behavioral risk factors among members of a managed care organization. *Am J Manag Care.* 2001;7:125-30.
- Steptoe A, Kerry S, Rink E, Hilton S. The impact of behavioral counseling on stage of change in fat intake, physical activity, and cigarette smoking in adults at risk of coronary heart disease. *Am J Public Health.* 2001;91:265-9.
- U.S. Preventive Services Task Force. *Guide to Clinical Preventive Services*, 2nd ed. Washington, DC: U.S. Department of Health and Human Services; 1996.
- Glanz K, Tziraki C, Albright CL, Fernandes J. Nutrition assessment and counseling practices: attitudes and interests of primary care physicians. *J Gen Intern Med.* 1995;10:89-92.
- Sherman SE, Hershman WY. Exercise counseling: how do general internists do? *J Gen Intern Med.* 1993;8:243-8.
- Meigs JB, Stafford RS. Cardiovascular disease prevention practices by U.S. physicians for patients with diabetes. *J Gen Intern Med.* 2000;15:220-8.
- Brown S, Birtwistle J, Roe L, Thompson C. The unhealthy lifestyle of people with schizophrenia. *Psychol Med.* 1999;29:697-701.
- Henderson DC, Cagliero E, Gray C, et al. Clozapine, diabetes mellitus, weight gain, and lipid abnormalities: a five-year naturalistic study. *Am J Psychiatry.* 2000;157:975-81.
- Allison DB, Mentore JL, Heo M, et al. Antipsychotic-induced weight gain: a comprehensive research synthesis. *Am J Psychiatry.* 1999;156:1686-96.
- Fava M. Weight gain and antidepressants. *J Clin Psychiatry.* 2000;61(suppl 11):37-41.
- Druss BG, Bradford DW, Rosenheck RA, Radford MJ, Krumholz HM. Mental disorders and use of cardiovascular procedures after myocardial infarction. *JAMA.* 2000;283:506-11.
- Druss BG, Bradford DW, Rosenheck RA, Radford MJ, Krumholz HM. Quality of medical care and excess mortality in older patients with mental disorders. *Arch Gen Psychiatry.* 2001;58:565-72.
- Desai MM, Bruce ML, Kasl SV. The effects of major depression and phobia on stage at diagnosis of breast cancer. *Int J Psychiatry Med.* 1999;29:29-45.
- Redelmeier DA, Tan SH, Booth GL. The treatment of unrelated disorders in patients with chronic medical diseases. *N Engl J Med.* 1998;338:1516-20.
- Desai MM, Rosenheck RA, Druss BG, Perlin JB. Mental disorders and quality of care among postacute myocardial infarction outpatients. *J Nerv Ment Dis.* 2002;190:51-3.
- McGillion J, Wanigaratne S, Feinmann C, Godden T, Byrne A. GPs' attitudes towards the treatment of drug misusers. *Br J Gen Pract.* 2000;50:385-6.
- Ritson EB. Alcohol, drugs and stigma. *Int J Clin Pract.* 1999;53:549-51.
- Dube CE, O'Donnell JF, Novack DH. Communication skills for preventive interventions. *Acad Med.* 2000;75(7 suppl):45-54.
- Lesser JM, Beller S, Harmon H. Communication with the elderly psychiatric outpatient. *Tex Med.* 1997;93:56-9.
- Scher M, Wilson L, Mason J. The management of chronic schizophrenia. *J Fam Pract.* 1980;11:407-13.
- Kizer KW. The "new VA": a national laboratory for health care quality management. *Am J Med Qual.* 1999;14:3-20.
- Halpern J. The measurement of quality of care in the Veterans Health Administration. *Med Care.* 1996;34(3 suppl):55-68.
- Hoff RA, Rosenheck RA. Cross-system service use among psychiatric patients: data from the Department of Veterans Affairs. *J Behav Health Serv Res.* 2000;27:98-106.
- Rosenheck R, Stolar M. Access to public mental health services: determinants of population coverage. *Med Care.* 1998;36:503-12.
- Rosenheck R, DiLella D. Department of Veterans Affairs National Mental Health Program Performance Monitoring System: Fiscal Year 1999 Report. West Haven, Conn: Northeast Program Evaluation Center; 2000.
- Leslie DL, Rosenheck R. The effect of institutional fiscal stress on the use of atypical antipsychotic medications in the treatment of schizophrenia. *J Nerv Ment Dis.* 2001;189:377-83.
- Liang K-Y, Zeger SL. Regression analysis for correlated data. *Annu Rev Public Health.* 1993;14:43-68.
- Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA.* 1998;280:1690-1.
- Druss BG, Rosenheck RA. Mental disorders and access to medical care in the United States. *Am J Psychiatry.* 1998;155:1775-7.
- Stafford RS, Farhat JH, Misra B, Schoenfeld DA. National patterns of physician activities related to obesity management. *Arch Fam Med.* 2000;9:631-8.
- Leermakers EA, Dunn AL, Blair SN. Exercise management of obesity. *Med Clin North Am.* 2000;84:419-40.