

Educational Gradients in Psychotropic Medication Use Among Older Adults in Costa Rica and the United States

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Objective: The relationship of education, psychiatric diagnoses, and use of psychotropic medication has been explored in the United States, but little is known about this relationship in poorer countries, despite the high burden of mental illness in these countries. This study estimated educational gradients in diagnosis and psychotropic drug use in the United States and Costa Rica, a middle-income country with universal health insurance. **Methods:** Analyses were conducted by using data of older adults (≥ 60) from the 2005 U.S. Medical Expenditure Panel Survey ($N=4,788$) and the 2005 Costa Rican Longevity and Healthy Aging Study ($N=2,827$). Logistic regressions examined the effect of education level (low, medium, or high) and urban residence on the rates of self-reported mental health diagnoses, screening diagnosis, and psychotropic medication use with and without an associated psychiatric diagnosis. **Results:** Rates of self-reported diagnoses were lower in the United States (12%) than in Costa Rica (20%), possibly reflecting differences in survey wording. In both countries, the odds of having depression were significantly lower among persons with high education. In Costa Rica, use of psychotropic medication among persons with self-reported diagnoses increased by education level. **Conclusions:** The educational gradients in medication use were different in the United States and Costa Rica, and stigma and access to care in these countries may play an important role in these differences, although type of insurance did not affect educational gradients in the United States. These analyses increase the evidence of the role of education in use of the health care system. (*Psychiatric Services* 65:1218–1225, 2014; doi: 10.1176/appi.ps.201300092)

Major depressive disorder is the second leading cause of years lived with disability worldwide, in both high-income and developing countries (1). This ranking remained constant between 1990 and 2010, despite improvements in psychotropic medicine availability.

Descriptive information on the patterns of diagnosis and treatment of depression in a variety of contexts will promote a better understanding of these global phenomena. However, there has been little systematic documentation of patterns of use of psychotropic medicine in developing countries. Much

more is known about use of psychotropic medications in the United States, where the medications are estimated to be underused among persons with a mental health condition but overused among persons without an appropriate diagnosis (2). The use of psychotropic medications in general populations continues to grow (3). Appropriate use of psychotropic medications has been shown to lead to improved symptom profiles, lower levels of disability, and greater productivity (4–6). Although psychotropic medications are used mostly for acute or maintenance therapy, as much as one-fifth of these medications may be used by persons with no history of mental illness (2,7). Use in undiagnosed populations may represent innovations in treatment, but most off-label use has been shown to have a low evidence base. Off-label use also may impart side effect risks and may represent a waste of scarce resources (2,8).

This study compared patterns of mental health diagnosis and psychotropic drug use in the United States and Costa Rica, a middle-income country with near-universal health insurance. The main objective was to estimate educational gradients, defined as differences in health and access to care that are positively or negatively related to education level. Educational gradients in health and access to care have been widely documented for many conditions in the United States (9,10). In Costa Rica, self-reported general medical health has been shown to improve with socioeconomic status, but the opposite is true for all-cause mortality,

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and there are no strong socioeconomic gradients in risk factors such as diabetes and high cholesterol (11). A comparison of gradients in risk factors for cardiovascular disease between Costa Rica and the United States found that educational gradients were generally stronger in the United States but that gradients for different risk factors varied by country (12). One hypothesized mechanism underlying educational gradients is that education may lead to higher income, improving the ability of people to buffer themselves against health risks and to purchase medical care and the most effective medications to treat disease. Other theories suggest the importance of improved cognition, relative social status, time preferences, or reverse causality, in which early-life disease lowers educational attainment (13). In the United States, socioeconomic status was strongly and inversely related to mental illness across a number of studies, regardless of how mental illness was defined or measured (5). However, we have much less information on treatment patterns across more- and less-developed countries or on the effects of education on treatment patterns within less-developed countries. In particular, little is known within the context of Costa Rica.

Costa Rica is a country of particular interest because of its historic emphasis on progressive social and health sector programs, including near-universal health insurance. The country has invested heavily in public health initiatives, has strongly promoted primary care initiatives, and adopted near-universal government health insurance in the 1970s (14). Costa Rica's overall life expectancy, which is higher than in the United States, has been linked to its social investments (15). The government health insurance program covers care at public facilities for 90% of the population; it pays full costs for most hospitalizations and outpatient care, although some individuals choose to pay out of pocket for private ambulatory care.

The publicly financed delivery system is organized into three main levels. The first level consists of local outpatient clinics that deliver primary care and a restricted list of free medications, which includes selected tricyclic antidepressants, benzodiazepines, and first-generation

antipsychotics. The second level consists of regional clinics and hospitals with basic specialized medicine, and the third level is composed of highly specialized hospitals in the capital, San José. At the system's higher levels, specialists can prescribe the basic list of medications plus two selective serotonin reuptake inhibitors and antipsychotics at no cost to the patient as long as the medications are included in the formulary. At private facilities, patients can pay out of pocket for a broader array of psychotropic medications, but only wealthier individuals typically can afford to do so.

This study compared patterns of self-report, current screening, and treatment rates and their relationship to education and demographic characteristics among adults age 60 and over in Costa Rica and the United States. We focused on the older population because of the availability of high-quality data in Costa Rica and because of the strong association between depression and advanced age (16,17). We used measures of both self-reported mental health diagnosis and survey-based depression screening in each population, because neither approach alone is ideal in identifying persons with current or prior history of mental illness. We examined whether use of the two largest classes of psychotropic medications, antipsychotics and antidepressants, varied by education level overall and among subgroups defined by diagnosis or depression screening. We hypothesized that the burden of mental illness within each country would be greater among populations with lower education. We also hypothesized that we would observe few educational gradients in Costa Rica because of uniform insurance coverage and a generally strong social safety net. We hypothesized that in the United States, there would be greater disparities by education in both depression and psychotropic medication use. We expected to find these disparities because a substantial proportion of the population age 60 and over lacked prescription coverage prior to implementation of Medicare Part D and because gradients in health and access to care related to nonmedical social determinants have been implicated in many other non-

psychiatric conditions in the United States (18).

Methods

We used two large, nationally representative data sources from Costa Rica and the United States: the Costa Rican Longevity and Healthy Aging Study (CRELES), a probabilistic sample of noninstitutionalized adults age 60 and over (11), from 2005 (N=2,827); and the Medical Expenditure Panel Survey (MEPS), a survey of the U.S. noninstitutionalized civilian population, also from 2005. We included only MEPS respondents who were age 60 and over (N=4,788), and we relied on the first round of interviews rather than the full panel of data to increase similarities between the two data sets. Sampling weights were used from both data sources to increase generalizability to each country's elderly populations.

Measures

Diagnosis was measured in two ways. First, self-reported mental health diagnosis is measured in the CRELES by responses to the question: "Has a physician ever told you that you have a nervous or psychiatric problem such as depression?" The MEPS does not contain a similarly worded question but rather asks respondents to list general medical and mental health conditions, including current symptoms, that were the cause of disability days or were associated with use of health services during the survey period; only conditions that occurred before or during the first round of interviews in 2005 were retained for this analysis. Despite the substantial differences in the wording of the two items, for the sake of brevity we refer to both assessments as "self-reported diagnosis."

Second, we used measures of depression screening to identify respondents with current symptoms of depression. In the CRELES, the Geriatric Depression Scale (19) is used to indicate current symptoms of depression, with a threshold of 6 indicating potential depression and a threshold of 11 indicating severe depression. In the MEPS, probable depression is defined as a score of ≥ 3 on the Patient Health Questionnaire-2 (PHQ-2) (20), which has been validated as a

depression screening tool in elderly populations (21). In the CRELES, the Geriatric Depression Scale was not obtained from proxy respondents, comprising 25% of the sample. In the MEPS, 13% of PHQ-2 screens were obtained by proxy. In sensitivity analyses, we excluded proxy responses and found very minor changes in results, so the full sample was retained for the reported analyses. Depression screeners and self-reported diagnoses have notable differences, and thus both are retained for this analysis. For example, persons with a prior history of depression or other psychiatric illnesses may self-report a diagnosis but not meet current criteria for depression. Persons with undetected illness or greater feelings of stigma may meet current clinical criteria but not self-report a diagnosis.

Psychotropic medication use was measured either by self-reporting current use or by bringing in prescription medication bottles during the interview, regardless of the level of use or the use of other treatment modalities. From the MEPS, we included only information about medications begun prior to the first round of interviews, again to retain consistency with the CRELES. We examined the use of the two largest classes of psychotropic medications, antidepressants and antipsychotics. The survey teams coded the medication names by drug class without requiring that the respondents recognize that the medications were psychotropic drugs.

Education level was coded into three categories. In the United States, individuals with less than a high school degree were classified as having low education (25%); individuals with a high school degree, medium education (34%); and individuals with post-secondary education, high education (41%). In Costa Rica, persons with two or fewer years of formal education were coded as having low education (28%); persons who completed primary education, medium education (51%); and persons with education beyond primary education, high education (22%). Numbers of respondents reported in the text are unweighted; multivariate analyses used complex sampling weights. Urban status was included because education and access

to care may vary by urbanicity. It was defined in Costa Rica on the basis of census block and in the United States as residence in a metropolitan statistical area.

Analyses

Logistic regression models were run on measures of self-reported diagnosis, screened depression, and antidepressant or antipsychotic medication use. Survey-weighted models examined the association between each of these outcome variables and education, demographic characteristics, and urban location for the entire sample in each country and for subsamples of persons in each country stratified by diagnosis. Both underreporting of psychiatric diagnoses and off-label use would contribute to psychotropic medication use in the undiagnosed population, so this measure is not intended to indicate quality. Persons with low and medium education were compared with those with high education, who served as the reference group. Odds ratios are reported for all comparisons.

Because of the heterogeneity of insurance sources in the United States and the potential for racial disparities, we ran additional models including insurance status (Medicaid, Medicare, and private insurance as well as prescription drug coverage), race, and Latino ethnicity.

We also undertook exploratory analyses of whether education affected the receipt of any psychotropic medications listed on Costa Rica's national formulary of medications that general practitioners (GPs) can prescribe and the receipt of medications that can only be prescribed by mental health specialists or self-pay private physicians, again stratified by self-reported diagnosis.

Results

Unadjusted analyses

Eighteen percent of older adults in Costa Rica screened positive for depression, and 4% were estimated to have severe depression (Table 1). In the United States, the rate of probable depression was just over 10%. The rate of self-reported diagnosis in Costa Rica was almost 20%. Just over 12% of the U.S. sample reported a mental

health condition. Although the self-reported diagnosis includes a broader set of behavioral health conditions than were screened for in the surveys, we found substantial discordance between screening results and self-reported diagnoses. In Costa Rica, 39% of those with current mild depression and 49% of those with severe depression self-reported a mental health diagnosis, whereas in the United States, 33% of those with probable depression self-reported a mental health diagnosis. A variety of reasons could explain these differences, including stigma, lack of access to care, and false positives in the screeners.

Almost 7% of the elderly Costa Rican population and almost 8% of the elderly U.S. population reported using an antidepressant during the study year. Only 23% of Costa Ricans but 41% of Americans with a self-reported diagnosis reported using antidepressants. Among those without a self-reported diagnosis, the rate of antidepressant use was about 3% in both populations. Antipsychotics had a greater rate of use in Costa Rica (2%) than in the United States (.7%).

Multivariate analyses

Diagnosis. We found no evidence of an educational gradient in self-reported diagnosis in either country but found an educational gradient in screened depression (Table 2). In Costa Rica, the odds of screening positive for depression were almost double among persons with lower education compared with those with high education (odds ratio [OR]=1.96, $p<.01$). We saw an even stronger educational gradient in the United States: those with less than high school education had more than three times the odds of probable depression than those with high education (OR=3.43, $p<.01$), and those with medium education had almost twice the odds of probable depression compared with those with high education (OR=1.88, $p<.01$). In the United States, the odds of self-reporting a mental health diagnosis among those with probable depression and low education were less than half the odds of self-reporting among those with probable depression and higher levels of education (OR=.36, $p<.01$).

Table 1Characteristics of older participants in nationally representative surveys from Costa Rica and the United States^a

Variable	Costa Rica (N=2,827)			United States (N=4,788)		
	N	Weighted %	Linearized SE	N	Weighted %	Linearized SE
Depression ^b						
Mild	387	17.6	1.0	—		
Severe	84	4.0	.5	—		
Probable	—			560	10.4	.6
Self-reported mental health diagnosis	526	19.6	.9	598	12.3	.6
Positive screen for mild depression	125	38.7	3.0	—		
Positive screen for severe depression	37	48.8	6.2	—		
Positive screen for probable depression	—			177	33.0	2.4
Antidepressant drug use	179	6.6	.5	378	7.8	.4
Self-reported mental health diagnosis	110	22.9	2.2	249	41.3	2.1
No self-reported mental health diagnosis	69	2.7	.4	129	3.2	.3
Antipsychotic drug use	66	2.0	.3	31	.7	.1
Self-reported mental health diagnosis	43	7.9	1.5	20	3.1	.7
No self-reported mental health diagnosis	21	.57	.15	11	.32	.11
Education ^c						
Low	1,068	27.5	.9	1,566	25.1	1.0
Medium	1,384	50.9	1.2	1,535	34.2	.9
High	375	21.5	1.1	1,687	40.7	1.1
Age (M±SD)	70.5±8.1		.2	71.4±7.4		.2
Male	1,293	47.5	1.2	2,038	44.2	.6
Urban residence/MSA ^d	1,701	62.6	1.1	3,762	80.1	2.3

^a Data for Costa Rica were from the Costa Rican Longevity and Healthy Aging Study (CRELES), a probabilistic sample of noninstitutionalized adults age ≥60, from 2005. Data for the United States were from the Medical Expenditure Panel Survey (MEPS) of the noninstitutionalized civilian population, also from 2005, but only data from respondents who were age ≥60 were included.

^b In the CRELES, the Geriatric Depression Scale was used to identify mild or severe depression, and in the MEPS, the Patient Health Questionnaire–2 was used to identify probable depression.

^c Among U.S. adults, low education was defined as less than high school; medium education, high school graduate; and high education, some college or postsecondary education. Among adults in Costa Rica, low education was defined as ≤2 years of primary education; medium education, completed primary education; and high education, some postprimary education.

^d Defined as living in a metropolitan statistical area (MSA) (United States) or by census block (Costa Rica)

Psychotropic medication use. We did not find strong evidence of an educational gradient in antidepressant use in either country (Table 3). Odds of antidepressant use in the United States population were similar across education categories; the odds of antidepressant use were lower among less educated Costa Ricans, but these differences were not statistically significant. However, educational gradients in Costa Rica began to emerge only as we conducted separate analyses by persons with and without a self-reported history of psychiatric illness. The odds of using antidepressants among persons with a self-reported diagnosis and low education were 34% of the odds for persons with a self-reported diagnosis and high education ($p<.01$). In Costa Rica, among those without a self-reported diagnosis, the odds of antidepressant use were 56% greater

among those with low education compared with those with high education, but the difference was not statistically significant. Among those without a self-reported diagnosis in the United States, the odds of using antidepressants were lower among those with low or medium education, but again, the difference was not statistically significant.

We found evidence of a positive gradient in antipsychotic medication use in Costa Rica, with persons with lower levels of education having substantially lower odds of using these medications compared with more educated persons, although the difference was statistically significant only for the comparison between persons with medium and high education ($OR=.31$, $p<.01$) (Table 4). The educational gradient in the United States was negative, meaning that persons with lower education

had higher odds of using antipsychotics than persons with high education, but the difference was not significant. Among those reporting a history of psychiatric diagnosis, the positive gradient in Costa Rica was even steeper than in the general population, while the positive gradient in the United States was similar to the general population and again not significant. In the United States, there was also a negative gradient in antipsychotic medication use among persons reporting a history of psychiatric diagnosis, but it was similar to the gradient in the general population and was not significant. Regarding antipsychotic use among those without a self-reported condition, again we saw a positive educational gradient in Costa Rica and a negative gradient in the United States, although neither result was statistically significant.

Table 2

Odds of self-reporting a mental health diagnosis and screening positive for depression among older adults from Costa Rica and the United States, by characteristic^a

Characteristic	Positive depression screen ^b										Self-reported diagnosis among those with a positive depression screen					
	Self-reported diagnosis				Mild or severe		Severe		Probable		Mild or severe		Severe		Probable	
	Costa Rica (N=2,812)	United States (N=4,788)	Costa Rica (N=2,115)	United States (N=2,115)	Costa Rica (N=2,115)	United States (N=4,413)	Costa Rica (N=2,115)	United States (N=4,413)	Costa Rica (N=2,115)	United States (N=4,413)	Costa Rica (N=386)	United States (N=84)	Costa Rica (N=386)	United States (N=84)	Costa Rica (N=386)	United States (N=560)
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Education (reference: high) ^c																
Low	1.26	.24	1.22	.16	1.96**	.45	1.41	.62	3.43**	.48	.89	.42	.82	.64	.36**	.10
Medium	1.10	.20	.99	.12	1.57*	.34	1.21	.49	1.88**	.28	1.00	.45	.83	.63	.63	.18
Male (reference: female)																
Age	.43**	.06	.42**	.04	.50**	.07	.62	.17	1.03	.12	.44**	.13	.85	.48	.45**	.11
Age ²	1.03	.10	1.00	.14	.74*	.10	1.16	.34	.78	.11	.99	.31	.82	.44	.67	.19
Age ²	1.00	<.01	1.00	<.01	1.00*	<.01	1.00	<.01	1.00	<.01	1.00	<.01	1.00	<.01	1.00	<.01
Urban residence/MSA ^d	1.05	.14	.98	.13	.69*	.10	.84	.24	.90	.14	1.50	.43	1.32	.71	1.29	.29

^a Data for Costa Rica were from the Costa Rican Longevity and Healthy Aging Study, a probabilistic sample of noninstitutionalized adults age ≥ 60 , from 2005. Self-reported diagnosis was not available for all participants. Data for the United States were from the Medical Expenditure Panel Survey (MEPS) of the noninstitutionalized civilian population, also from 2005, but only data from respondents who were age ≥ 60 were included.

^b In the CRELES, the Geriatric Depression Scale was used to identify mild or severe depression, and in the MEPS, the Patient Health Questionnaire–2 was used to identify probable depression. Scores were not available for all participants.

^c Among U.S. adults, low education was defined as less than high school; medium education, high school graduate; and high education, some college or postsecondary education. Among adults in Costa Rica, low education was defined as ≤ 2 years of primary education; medium education, completed primary education; and high education, some postprimary education.

^d The reference groups were persons living in a census block classified as rural (Costa Rica) or persons not living in a metropolitan statistical area (MSA) (United States).

* $p < .05$, ** $p < .01$

Exploratory analysis

Including insurance, race, and ethnicity in the U.S. models did not affect the results for educational gradients, but each variable was generally associated with diagnosis and medication use (data not shown).

In the exploratory analysis of access to psychotropic medications through the general and specialty sectors in Costa Rica, we found little evidence of an educational gradient in the receipt of any psychotropic medications from the GP national formulary but saw a significant positive gradient in the receipt of specialty medications (low education, OR=.29, $p < .01$; medium education, OR=.31, $p < .01$) (Table 5). Among those with self-reported diagnoses, however, a large positive gradient in access to psychotropic medications covered by the GP formulary appeared, with the lower educated having less than half the odds (OR=.45, $p < .05$) of receiving a psychotropic medication covered by the country's GP formulary

than those with high education. The gradient in use of specialty prescriptions was also much steeper among those with self-reported diagnoses. Finally, among those without self-reported diagnoses, we did not find strong evidence of educational gradients, although the results suggest that persons with low education had greater access to medications on the GP formulary and less access to restricted medications.

Discussion

The finding of greater prevalence of depression among less educated persons in both Costa Rica and the United States is consistent with other studies (5,22). In the United States, the lower level of self-reporting among less educated persons with probable depression is consistent with other articles in the literature (18).

Overall, we did not find strong evidence of educational gradients in antidepressant use in either country.

In subsample analyses, however, we found evidence that in Costa Rica, high education was associated with greater antidepressant treatment prevalence among those with self-reported diagnoses. In the United States, we saw no such trends in antidepressant use by education.

In the United States, broad Medicaid coverage for persons of low socioeconomic status may effectively counterbalance greater access to psychotropic medication by persons with higher education, thus resulting in fairly equal access across education groups. In Costa Rica, because of the presence of a national formulary, the patterns of use of psychotropic medication may reflect better access to public specialty care providers or to private providers by persons with higher education. Further research should explore whether persons with higher education experience lower stigma or have better knowledge about mental health care treatment.

Table 3

Odds of antidepressant use among older adults from Costa Rica and the United States who did or not self-report a mental health diagnosis, by characteristic^a

Characteristic	Total				Self-reported diagnosis				No self-reported diagnosis			
	Costa Rica (N=2,827)		United States (N=4,788)		Costa Rica (N=526)		United States (N=598)		Costa Rica (N=2,286)		United States (N=4,190)	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Education (reference: high) ^b												
Low	.75	.21	.99	.16	.34**	.14	1.05	.24	1.56	.74	.67	.20
Medium	.74	.18	.86	.14	.57	.20	.76	.18	.84	.37	.91	.22
Male (reference: female)	.38**	.08	.45**	.06	.52*	.16	1.06	.24	.51*	.15	.42**	.09
Age	1.68*	.34	.81	.13	2.28*	.75	.78	.21	1.33	.31	.80	.21
Age ²	1.00**	<.01	1.00	<.01	.99*	<.01	1.00	<.01	1.00	<.01	1.00	<.01
Urban residence/MSA ^c	1.30	.27	.88	.13	1.06	.30	.99	.22	1.73	.62	.77	.19

^a Data for Costa Rica were from the Costa Rican Longevity and Healthy Aging Study, a probabilistic sample of noninstitutionalized adults age ≥60, from 2005. Information about self-reported diagnoses were available for 2,812 respondents. Data for the United States were from the Medical Expenditure Panel Survey (MEPS) of the noninstitutionalized civilian population, also from 2005, but only data from respondents who were age ≥60 were included.

^b Among U.S. adults, low education was defined as less than high school; medium education, high school graduate; and high education, some college or postsecondary education. Among adults in Costa Rica, low education was defined as ≤2 years of primary education; medium education, completed primary education; and high education, some postprimary education.

^c The reference groups were persons living in a census block classified as rural (Costa Rica) or persons not living in a metropolitan statistical area (MSA) (United States).

*p<.05, **p<.01

We also saw very different patterns among users of antipsychotics in Costa Rica and the United States. In Costa Rica, elderly persons with greater education had substantially greater use of

antipsychotics overall and among both those who did and did not self-report a diagnosis. In the United States, the trend was exactly the opposite, with more highly educated respondents being less

likely to use antipsychotic medications and the presence of a much weaker association between education and use. The cause of this difference in Costa Rica may be due to the limitations on

Table 4

Odds of antipsychotic use among older adults from Costa Rica and the United States who did or not self-report a mental health diagnosis, by characteristic^a

Characteristic	Total				Self-reported diagnosis				No self-reported diagnosis			
	Costa Rica (N=2,827)		United States (N=4,788)		Costa Rica (N=526)		United States (N=598)		Costa Rica (N=2,286)		United States (N=4,190)	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Education (reference: high) ^b												
Low	.40	.19	1.90	1.02	.27*	.16	1.86	1.26	.46	.27	1.68	1.60
Medium	.31**	.13	1.26	.71	.23**	.12	1.12	.72	.42	.30	1.55	1.53
Male (reference: female)	.83	.27	.61	.28	1.71	.71	1.62	.87	.82	.47	.42	.30
Age	1.25	.32	2.27	1.25	1.10	.33	3.39	2.30	1.78	.63	1.54	1.35
Age ²	1.00	<.01	.99	<.01	1.00	<.01	.99	<.01	1.00	<.01	1.00	<.01
Urban residence/MSA ^c	.74	.30	.72	.34	.48	.23	.50	.28	2.46	1.30	2.17	2.01

^a Data for Costa Rica were from the Costa Rican Longevity and Healthy Aging Study, a probabilistic sample of noninstitutionalized adults age ≥60, from 2005. Information about self-reported diagnoses were available for 2,812 respondents. Data for the United States were from the Medical Expenditure Panel Survey (MEPS) of the noninstitutionalized civilian population, also from 2005, but only data from respondents who were age ≥60 were included.

^b Among U.S. adults, low education was defined as less than high school; medium education, high school graduate; and high education, some college or postsecondary education. Among adults in Costa Rica, low education was defined as ≤2 years of primary education; medium education, completed primary education; and high education, some postprimary education.

^c The reference groups were persons living in a census block classified as rural (Costa Rica) or persons not living in a metropolitan statistical area (MSA) (United States).

*p<.05, **p<.01

Table 5

Odds of receipt of psychotropic medication available in the GP national formulary or through specialty prescription among older adults in Costa Rica who did or did not report a mental health diagnosis, by characteristic^a

Characteristic	Total (N=2,827)				Self-reported diagnosis (N=526)				No self-reported diagnosis (N=2,286)			
	GP formulary		Specialty prescription		GP formulary		Specialty prescription		GP formulary		Specialty prescription	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Education (reference: high) ^b												
Low	.86	.24	.29**	.14	.45*	.18	.17**	.10	1.48	.68	.32	.25
Medium	.78	.19	.31**	.13	.68	.24	.19**	.094	.77	.32	.66	.52
Male (reference: female)	.387**	.078	.73	.26	.52*	.16	1.50	.65	.52*	.15	.77	.53
Age	1.73**	.34	1.05	.28	2.79**	.98	.84	.24	1.25	.26	2.06	.94
Age ²	1.00**	<.01	1.00	<.01	.99**	<.01	1.00	<.01	1.00	<.01	1.00	<.01
Urban residence (reference: rural)	1.26	.25	.76	.33	1.03	.28	.48	.23	1.62	.56	5.60*	4.19

^a Data were from the Costa Rican Longevity and Healthy Aging Study, a probabilistic sample of noninstitutionalized adults age ≥ 60 , from 2005. Information about self-reported diagnoses were available for 2,812 respondents. The general practitioner (GP) national formulary includes drugs that public-sector GPs are able to prescribe. Specialty prescriptions require access to a specialist or private physician.

^b Low education was defined as ≤ 2 years of primary education; medium education, completed primary education; and high education, some postprimary education.

* $p < .05$, ** $p < .01$

prescribing antipsychotic medications in primary care. Although the national formulary should preserve access to psychotropic medications for persons at all education levels, we found evidence that less educated persons experienced access barriers to treatment in part because of the limited number of psychotropic medications available through generalists.

These results should be interpreted in light of a number of limitations. Self-reported diagnoses were elicited differently in the two surveys, and because the MEPS data rely on the reporting of specific conditions, persons who self-report a diagnosis in the MEPS may have experienced symptoms more recently than persons who self-report a diagnosis in the CRELES. However, given that institutionalization rates are lower in Costa Rica than in the United States, the sample in Costa Rica may have been more acutely ill. Appropriateness of medication use cannot be determined by these data. Finally, the concordance between depression diagnosis and antidepressant use may be stronger than the link between psychiatric diagnosis and antipsychotic medication use, given that appropriate screeners for psychiatric disorders other than depression were not available in either data source.

More fundamentally, better understanding is needed of the underlying cultural factors that may mediate and moderate education effects in different settings. A review of psychotropic adherence in the United States documented extensive evidence of substantially lower adherence among Latinos compared with European Americans (23), but the reasons for this finding are still poorly understood. We are not aware of any specific research on cultural factors in Costa Rica that could influence psychotropic medication patterns among persons with different education levels. Better understanding of such sociocultural factors will be important for informing culturally appropriate clinical interventions to address any inappropriate care that may be substantiated by future work.

Conclusions

We found similar patterns of educational gradients in self-reported diagnosis and depression screening between the United States and Costa Rica but very different patterns of medication use by education in these two countries. Differences in stigma and access to care may play an important role in explaining differences between the countries, although we did not find evidence that

insurance affected educational gradients in the United States. These analyses increase the evidence for the role of education in the use of the health care system and in health status. Future research should examine the appropriateness of medication use among persons with different education levels and how the expansion of health insurance coverage through Medicare Part D and the Affordable Care Act has affected health care among elderly and near-elderly residents of the United States.

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