

The Use of Prescription Medications Obtained from Non-medical Sources among Immigrant Latinos in the Rural Southeastern U.S.

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Abstract: We explored the relationships between behavioral, socio-cultural, and psychological characteristics and the use of prescription medications obtained from non-medical sources among predominantly Spanish-speaking Latinos in the rural southeastern U.S. Respondent-driven sampling (RDS) was used to identify, recruit, and enroll immigrant Latinos to participate in an interviewer-administered assessment. A total of 164 respondents were interviewed in 2009. Average age was 34 years old, 64% of respondents were female, and nearly 85% reported being from Mexico. Unweighted and RDS-weighted prevalence estimates of any non-medical source of prescription medications were 22.6% and 15.1%, respectively. In multivariable modeling, respondents who perceived their documentation status as a barrier to health care and those with higher educational attainment were significantly more likely to report use of non-medical sources. Interventions are needed to increase knowledge of eligibility to sources of medical care and treatment and ensure culturally congruent services for immigrant communities in the U.S.

Key words: Prescription medications, non-medical sources, Latino immigrants, ethnic minority groups.

Although California, Florida, New York, and Texas have a well established history of Latino immigration, recent trends in immigration patterns have resulted in changing demographics in the southeastern United States (U.S.). Currently, North Carolina (NC) has one of the fastest growing Latino populations in the U.S.¹ Immigrants to the Southeast are likely to be recently arrived and from rural communities in southern Mexico and Central America, while earlier immigrants tended to be from

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for participation included being Latino or Hispanic (self-identified), a U.S. non-native, and 18 years of age or older, and providing informed consent. After participating in the in-person assessment, each seed was trained in the RDS recruitment protocol, including peer recruitment, inclusion criteria, reimbursement, and the ethical treatment of peer recruits. Data collection began by recruiting and enrolling eight group members (known as *seeds*^{24,25}) who met eligibility requirements. These seeds initiated the chain-referral process.

Although not designed as a community-based participatory research (CBPR) study, members of a well-established CBPR partnership²⁶⁻²⁸ facilitated the recruitment of native Spanish-speaking Latino seeds who understood local community health and medical care use patterns and were willing to speak openly about the use of non-medical sources of prescription medications. Diversity among seeds accelerates the rate at which the sample reaches equilibrium;²⁰ thus, seeds were selected to represent the diversity of the Latino community, including sex, age, and countries of origin. Each seed also reported living in one of seven rural counties in central NC (population densities below 1,000 per square mile) selected *a priori*.²⁶ When compared with other counties in NC, these counties had higher percentages of people self-identifying as Latino and had more rapid Latino population growth rates.²⁹

After recruits contacted study staff *via* a toll-free telephone number, were deemed eligible, and provided informed consent, they were enrolled and their data were collected in person using the same assessment as was used with seeds. Immediately after completing the assessment, each respondent also was trained in the RDS recruitment protocol.

Each seed and subsequent respondent received three recruitment coupons to give recruits (potential respondents). The coupons included low-literacy Spanish-language information about the study including a toll-free telephone number. To generate sample weights for RDS prevalence estimates in analysis, coupons were coded to match the recruiter to the respondent; a coupon was collected by the interviewer from each respondent.

This chain-referral process continued until the *a priori* desired sample size was obtained. Each respondent was compensated \$50 for participation in the assessment and received another \$20 (for a maximum total of \$60) for recruitment of each of the three referrals.

Data collection. Data were collected by two trained native Spanish-speaking interviewers: one male and one female. These interviewers had cellular telephones and a toll-free number for potential respondents to call to schedule in-person screening and interviewing. Data collection took eight months.

Measurements. The assessment was based on formative studies in NC that provided insight into constructs for measurement. Furthermore, many assessment items had been tested for comprehension and acceptability and successfully used previously with the Latino community in NC.^{4,30-32} The assessment was interviewer-administered to overcome poor literacy and took 45–60 minutes to complete. Most items had been previously validated in Latino populations.^{6,33,34} To address weaknesses of traditional translation/back-translation approaches, items that did not already exist in Spanish were translated into Spanish using a committee approach whose members have skill sets

northern regions of Mexico. These immigrant Latinos tend to be young and have high rates of low literacy.²

Immigrant Latinos face multiple barriers that limit access to, and utilization of, formal medical and health care services. Most southeastern states that are experiencing rapid growth of immigrant Latino communities do not have a history of providing Spanish-language medical and health care services, and public and private agencies and community-based organizations have limited bilingual and bicultural services.³⁻⁵ Lack of knowledge of the U.S. health care system further limits their access to, and utilization of, medical and health care. Many immigrant Latinos in the Southeast report experiencing discrimination when seeking health care,³ and most lack health insurance.⁶ Furthermore, undocumented Latinos report fearing discovery and deportation and avoiding formal systems of health care, which leads to limited use of health care services and little exposure to preventive education.^{5,6} Distrust of the health care system and providers, limited clinic hours, lack of bilingual and bicultural resources, and insufficient public transportation also have been identified as barriers to accessing and seeking health care for this population.^{3,6,7}

Given multi-level barriers that limit access to, and utilization of, formal medical care and prior experiences with health care systems outside of the U.S. that may provide easier access to prescription medications,⁸ some immigrant Latinos in the U.S. have reported obtaining prescription medications from non-medical sources such as *tiendas* (grocers), *bodegas*, *botánicas* (stores selling folk or alternative medicine), flea markets, and other businesses marketing to immigrant Latinos.^{4,8-10} Limited evidence in Arizona, Florida, and urban enclaves (including neighborhoods in Manhattan) has suggested an underground supply of prescription medications illegally sold and/or distributed to Latinos through *tiendas*, *bodegas*, *botánicas*, flea markets, and other businesses marketing to Latinos. These outlets have been identified as providing fast, affordable, and accessible medications (e.g., antibiotics, birth control, and hormones for male-to-female transgender transitioning and maintenance).^{8,11-19} Studies in NC have suggested *tiendas* and flea markets, in particular, may be major sources of prescription medications for immigrant Latinos settling in rural areas in which access to services is limited.^{10,16}

Because little is known about the use of non-medical sources of prescription medications among predominantly Spanish-speaking immigrant Latinos, this study was designed to identify salient behavioral, socio-cultural, and psychological correlates of use of prescription medications obtained from non-medical sources among predominantly Spanish-speaking Latinos in the rural southeastern U.S. using respondent-driven sampling (RDS).

Methods

Respondent-driven sampling (RDS) and setting. Respondent-driven sampling methods were used. Respondent-driven sampling is an extension of chain-referral methods, but provides a basis to calculate unbiased estimates of population parameters. Respondent-driven sampling relies on respondents to recruit a limited number of subsequent respondents who are part of their social networks.²⁰⁻²⁴ Eligibility criteria

beyond those of a translator. A group was convened that included translators, content specialists, a questionnaire design expert, and an adjudicator. Each person independently translated the items. The committee met to discuss versions of the translation, and the reconciled, Spanish-language version was created and reviewed for final approval by the partnership and its implementation. Prior to administration, the assessment was pretested and revised for comprehension, personal relevance, and acceptability. Human subject review and study oversight were provided by the Institutional Review Board of Wake Forest University Health Sciences.

Outcome measures. Use of non-medical sources of prescription medications was, in theoretical terms, first *depersonalized* through *third-personing*^{35,36} (e.g., “Sometimes, when people in the U.S. cannot afford prescription medications from doctors, they travel to Mexico or Canada to purchase medicine at a lower cost; sometimes they also use alternative community sources to get the medicines they need”) to reduce response bias. The first set of questions asked whether the respondent knew of immigrant Latinos using “*tiendas*”; “flea markets”; “tradition healers” (including “*curanderos*” [folk-healers], “*hueseros*” [bone-setters], and “*parteras*” [midwives]); “friends and/or family in the U.S.”; “friends and/or family in [their] country of origin”; “the Internet”; and any other source specified to obtain prescription medications.

The second set of questions assessed whether the respondent had ever used these sources in the U.S., and for each source, what type of medications were obtained. We used this measurement as our primary outcome. Use of non-medical sources of prescription medications was coded *Yes* if the person responded that they had ever used any of these sources in the U.S. and *No* if person responded that they had never used any of these sources in the U.S.

Explanatory variables. Demographic characteristics were identified, including age, gender, age started living in U.S., total years in U.S., country of origin, educational attainment, annual income, and health status. Acculturation was measured using the Short Acculturation Scale for Hispanics.³⁷

Other variables measured included frequency of shopping at *tiendas* in the past 30 days, knowledge of antibiotics and penicillin, various perceived practical barriers to accessing health care, and psychosocial variables including trust of medical providers, perceived discrimination, religiosity, mastery, and social support.

Knowledge of antibiotics and penicillin was assessed through the summation of correct responses to 10 true-false items that were developed by the CBPR partnership based on formative research^{4,31} and CBPR partner insights suggesting that the terms “antibiotic” and “penicillin” would be widely recognizable and commonly used by Latinos settling in the Southeast. Sample items included, “Antibiotics like penicillin should be shared by all family members who are sick” and “The flu can be treated with penicillin.”

Perceived practical barriers to accessing health care were measured using a previously constructed scale for Latino men.⁶ The scale was scored by adding responses (No = 0; Yes = 1) to “Have any of the following reasons prevented you from seeking or getting health care in the past 12 months?” Of the 13 reasons assessed, sample reasons included “You did not have transportation” and “It took too long to get an appointment.”

Documentation status as a perceived barrier to seeking health care was measured using the item, “Has fear of deportation or problems with documentation status ever

prevented you from seeking health care in North Carolina?" Response options were *No* and *Yes*. Fear of Immigration and Customs Enforcement (ICE) officials as a barrier to seeking health care was measured using the item, "Has fear of Immigration and Customs Enforcement officials been a barrier to health care for you in the past 12 months?" Respondents who answered "No barrier at all" were coded *No*. If respondents answered "A small barrier," "A moderate barrier," or "A great barrier" then they were coded *Yes*.

Provider trust was measured using the Wake Forest Physician Trust Scale.³³ Sample items included, "I completely trust doctors' decisions about which medical treatments are best" and "A doctor would never mislead me about anything." Likert-scale response options ranged from *Strongly disagree* to *Strongly agree*.

Perceived discrimination was measured using two items that were analyzed separately. The first item, "Since coming to the U.S., I often have the feeling that I am being treated unfairly because of my ethnicity," had response options ranging from *Strongly disagree* to *Strongly agree*. This item has been found to be an independent predictor of increased negative health outcomes and impaired health functioning.³⁸ Respondents also were asked, "Since coming to the U.S., have you ever experienced discrimination or been the victim of violence due to your race?" Response options included *No* and *Yes*.

Mastery has been defined as the extent to which one regards life changes as being under one's own control in contrast to being externally controlled or fatalistically ruled. An established seven-item scale with strong evidence of reliability and construct validity was used.³⁹⁻⁴¹ A sample item from this scale included, "There is really no way I can solve some of the problems I have." Likert-scale response options ranged from *Strongly disagree* to *Strongly agree*.

The Index of Sojourner Social Support Scale assessed social support.⁴² This scale includes 18 actions in response to the following stem, "Tell me if you know people in North Carolina or outside North Carolina, with whom you are maintaining some form of regular contact, who would perform each of the following helpful behaviors." Behaviors included, "Comfort you whenever you feel homesick," "Provide necessary information to help orient you to your new surroundings," and "Help you deal with some local institutions' official rules and regulations." Likert-scale response included, *No one would do this*, *Someone would do this*, *A few would do this*, *Several would do this*, and *Many would do this*.

Religiosity was measured using The Santa Clara Strength of Religious Faith Questionnaire.^{41,43} Sample items included, "My religious faith is extremely important to me" and "My faith impacts many of my decisions." Likert-scale response options ranged from *Strongly disagree* to *Strongly agree*.

Network variables. Respondent-driven sampling-specific measures for weighting prevalence estimates included personal network size, how many people the respondent knew who fit the inclusion criteria, and how well the respondent knew his or her recruiter.²⁰

Data analysis. Descriptive statistics, including frequencies and percentages or means, standard deviations, and ranges, were calculated. Use of non-medical sources of prescription medications was dichotomized into those respondents who reported using non-medical sources themselves and those who did not. Unadjusted prevalence and their 95% Wilson confidence intervals (CI)⁴⁴ were estimated.

Respondent-driven sampling-weighted prevalence and weighted 95% CIs were estimated using sampling weights computed using the RDS Analysis Tool (RDSAT) version 5.6.⁴⁵ These sampling weights accounted for network effects of respondents recruiting other respondents (i.e., the tendency of recruiters to recruit others like themselves).^{20,21}

Logistic regression modeling tested the independent contribution of each of the explanatory variables while adjusting for the other variables in the model using SAS version 9.2.⁴⁶ Odds ratios (ORs) and 95% CIs were calculated to assess the magnitude of association between explanatory variables and non-medical sources of prescription medications.

Respondent-driven sampling samples are not self-weighted because respondents vary in network size and the extent to which they are successful in recruitment. When sampling is associated with potential independent variables in a multivariable model, those variables should be included, but it is not necessary to weight observations.^{47,48} Thus, the multivariate results shown were derived from unweighted estimates.

Results

Demographic and selected characteristics. A total of 164 immigrant Latino respondents participated in this study. Sample demographic and selected characteristics overall and by users and nonusers of non-medical sources of prescription medications are presented in Table 1. The mean age of respondents was 34 years old, and 64% were female. The mean number of years living in the U.S. was 11 years, and the mean age when first coming to the U.S. to live was 22 years old.

The sample was predominantly from Mexico (85%). Nearly 60% of respondents reported completing eight or more years of education and 85% reported individual earning less than \$20,000 annually. Seventy percent of the sample reported their health status as good, very good, or excellent. Respondents scored low on acculturation and had limited knowledge about antibiotics and penicillin.

Of 13 practical barriers to accessing health care, respondents reported experiencing a mean of over three barriers in the preceding 12 months. Furthermore, more than one out of five respondents feared deportation or perceived documentation status as a barrier to seeking health care, and one out of four respondents identified fear of ICE as a barrier to seeking health care within the past 12 months.

Almost half of the respondents reported that they were treated unfairly because of their ethnicity and over one-third reported they were the victim of violence due to their race, since coming to the U.S. Respondents scored low on mastery and social support. Perceived religiosity was high.

Non-medical source of prescription medications. Table 2 presents non-medical sources of prescription medications, the unweighted percentage, the RDS-weighted prevalence estimates, and corresponding 95% CIs. The overall unweighted prevalence and the RDS-weighted prevalence estimate of any non-medical source of prescription medications were 22.6% (95% CI = 16.8–29.5) and 15.1% (95% CI = 10.1–23.1), respectively. The most common source was *tiendas* (RDS-weighted prevalence = 12.7%; 95% CI = 8.3–21.6), followed by friends or family from country of origin (RDS-weighted prevalence = 6.3%; 95% CI = 2.5–10.7), and friends or family in the U.S. (RDS-weighted

Table 1.**SAMPLE DEMOGRAPHIC AND SELECTED CHARACTERISTICS OF IMMIGRANT LATINO RDS RESPONDENTS (N=164)**

Characteristic	N (%) or Mean (SD)
Age, mean (SD)	34 (10)
Gender, no. (%)	
Male	55 (36)
Female	96 (64)
Age when first came to US to live, mean (SD)	22 (9)
Total years lived in US, mean (SD)	11 (6)
Country of origine, no. (%)	
El Salvador	9 (6)
Guatemala	10 (7)
Mexico	136 (85)
Nicaragua	2 (1)
Panama	2 (1)
Educational attainment, no. (%)	
Grade 1-6	66 (40)
Grade 7-8	27 (17)
Some high school	19 (12)
High school diploma or equivalent (GED)	43 (26)
Some college	6 (4)
Graduated college	2 (1)
Estimated annual income, no. (%)	
<\$20,000	127 (85)
\$20,000-\$29,999	17 (11)
\$30,000-\$39,999	4 (3)
\$40,000-\$49,999	1 (0.7)
≥\$50,000	1 (0.7)
Health status, no. (%)	
Excellent	22 (14)
Very good	18 (11)
Good	73 (45)
Fair	30 (18)
Poor	20 (12)
Acculturation (12-item scale; $\alpha=0.83$; range 1-60), mean (SD)	18.7 (5.9)
Shopping at Tiendas, no. (%)	
Always	68 (42)
Usually	37 (23)
Sometimes	41 (25)
Rarely	11 (7)
Never	6 (4)

(Continued on p. 685)

Table 1. (continued)

Characteristic	N (%) or Mean (SD)
Knowledge of antibiotics and penicillin (10-item scale; $\alpha=0.35$; range 0–10), mean (SD)	5.9 (2.4)
Perceived practical barriers to accessing health care (13-item scale; $\alpha=0.73$; range 0–13), mean (SD)	3.6 (2.3)
Documentation status as a perceived barrier to seeking health care, no. (%)	
Yes	33 (21)
No	126 (79)
Fear of Immigration and Customs Enforcement (ICE) officials as a barrier to seeking health care, no. (%)	
Yes	41 (26)
No	117 (74)
Provider trust (5-item scale; $\alpha=0.60$; range 1–20), mean (SD)	12.8 (2.3)
Treated unfairly because of ethnicity, no. (%)	
Strongly disagree	16 (10)
Disagree	76 (48)
Agree	60 (38)
Strongly agree	8 (5)
Experienced discrimination or been the victim of violence due to race, no. (%)	
Yes	56 (35)
No	105 (65)
Religiosity (10-item scales; $\alpha=0.96$; range 1–40), mean (SD)	30.2 (7.0)
Mastery (7-item scale; $\alpha=0.64$; range 1–28), mean (SD)	17.0 (2.4)
Social support (18-item scale; $\alpha=0.94$; range 0–72), mean (SD)	26.6 (11.5)

SD = Standard Deviation

prevalence = 4.4%; 95% CI = 1.8–7.8). None of respondents reported Internet use as a source of prescription medications.

Table 3 presents the medications or symptoms for which respondents reported obtaining medications from non-medical sources. Medications for upper respiratory infections or flu were the most prevalent category of medications or symptoms reported by respondents, followed by analgesics and antibiotics.

Respondent characteristics associated with non-medical sources of prescription medications. In univariate analyses (Table 4), four characteristics were significantly associated with the use of non-medical sources of prescription medications ($p<.05$): (1) perceived practical barriers to accessing health care in the past 12 months (OR = 1.21; 95% CI = 1.03, 1.42); (2) documentation status as a perceived barrier to seeking

Table 2.**PREVALENCE ESTIMATES OF NON-MEDICAL SOURCES OF PRESCRIPTION MEDICATIONS AMONG IMMIGRANT LATINOS IN THE RURAL SOUTHEASTERN USA (N=164)**

Source	N	Unweighted % (95% CI)	RDS weighted % (95% CI)
Any source	37	22.6% (16.8, 29.5)	15.1% (10.1, 23.1)
Tiendas	28	18.0% (12.7, 24.7)	12.7% (8.3, 21.6)
Flea markets	3	1.9% (0.6, 5.5)	2.0% (0.7, 5.5)
Traditional healers	1	0.6% (0.1, 3.5)	Cannot calculate estimate ^a
Friends/family	7	4.6% (2.2, 9.1)	4.4% (1.8, 7.8)
Friends/family from country of origin	10	6.5% (3.6, 11.6)	6.3% (2.5, 10.7)
Internet	0	—	—

^aA group recruited exclusively from within its own group. Estimates cannot be generated from this dataset.
CI = Confidence Interval

health care in the past 12 months (OR = 2.76; 95% CI = 1.21, 6.32); (3) a history of being treated unfairly because of ethnicity since coming to the U.S. (OR = 2.12; 95% CI = 1.01, 4.47); and (4) more frequent shopping at *tiendas* in the past 30 days (OR = 2.39; 95% CI = 1.01, 5.64).

In addition to these four significant variables from univariate analysis, three demographic characteristics (age, gender, and educational attainment) were included in the final multivariable model since there is some evidence that age, gender, and educational attainment are related to overall health status among Latino immigrants.^{49,50} As presented in Table 4, respondents who reported barriers to seeking health care due to documentation status (OR = 3.02; 95% CI = 1.10, 8.25) and those with higher educational attainment (OR = 2.86; 95% CI = 1.04, 7.88) were more likely to report use of non-medical sources of prescription medications ($p < .05$).

Discussion

To our knowledge, this exploratory study was the first to develop prevalence estimates of the use of non-medical sources of prescription medications and to examine the associations between use of non-medical sources of prescription medications and explanatory variables among the burgeoning immigrant Latino population in the southeastern U.S. Because a sampling frame is difficult to establish, particularly among communities that would prefer to remain hidden from researchers and practitioners (including communities that may have a percentage of undocumented immigrants and those that fear discrimination), RDS allows for prevalence to be estimated.

Table 3.**MEDICATIONS OR SYMPTOMS FROM NON-MEDICAL SOURCES AMONG IMMIGRANT LATINOS IN THE RURAL SOUTHEASTERN USA (N=172)^a**

Medications or Symptoms	Number of Respondents Reporting
Upper Respiratory Infection or flu	40 (23%)
Analgesics	32 (19%)
Antibiotics	28 (16%)
Birth control, Erectile dysfunction, STDs	13 (8%)
Fever	13 (8%)
Nonspecific infection	12 (7%)
Vitamins	12 (7%)
Orthopedics	4 (2%)
Parasites	3 (2%)
Other	15 (9%)

^aMultiple answers were possible.

Using the RDS-weighted sample, our findings indicated that about one in six immigrant Latinos obtained prescription medications from non-medical sources. The primary source was local *tiendas*. These *tiendas* typically are a common place for immigrant Latinos to find products with which they are familiar. *Tiendas* also provide a community space to cash checks and send money to family members in their countries of origin, and a network to satisfy a variety of needs.^{32,51} Few respondents reported using *botánicas* or flea markets; these may be more commonly used to purchase traditional remedies such as teas, tonics, and herbs.

The top three medications or symptoms from non-medical sources were upper respiratory infection or flu, analgesics, and antibiotics. This result indicated that many immigrant Latinos self-prescribed and obtained antibiotics to treat infections from non-medical sources. This finding is consistent with other research¹³ and may warrant the development, implementation, and evaluation of interventions to promote judicious antibiotic use among Latinos.

Results also indicated that immigrant Latinos who reported perceived documentation status as a barrier to seeking health care were more likely to use non-medical sources of prescription medications. These respondents may be discouraged from seeking medical sources given the socio-political environment. This study occurred within communities with recent allegations that public health department records, for example, had been used in deportation proceedings.^{3,4} However, the current national debate around immigration and health care may serve as barrier to health and medical care and influence immigrant Latinos throughout the country to use non-medical sources of prescription medications.

Table 4.

**CORRELATES OF USE OF NONMEDICAL SOURCES OF
 PRESCRIPTION MEDICATIONS AMONG IMMIGRANT LATINOS:
 LOGISTIC REGRESSION UNIVARIATE AND MULTIVARIABLE
 ANALYSIS RESULTS (N=153-164)**

Characteristic	Nonmedical Sources of Prescription Medications (Any source vs. No use)	
	OR (95% CI)	Adjusted OR (95% CI)
Age	1.02 (0.98–1.06)	1.04 (0.99–1.09)
Gender		
Male	0.84 (0.37–1.90)	.74 (0.28–1.92)
Female		
Age when first came to US to live		
≤18 years old	0.71 (0.33–1.50)	NA
>18 years old		
Total years lived in US	1.04 (0.98–1.10)	NA
Country of origine		NA
Mexico	1.13 (0.39–3.28)	
Other countries (El Salvador, Guatemala, Nicaragua or Panama)		
Educational attainment		
Higher than Grade 6	1.83 (0.83–4.03)	2.86* (1.04–7.88)
Grade 6 or less		
Estimated individual annual income		
<\$20,000	0.88 (0.32–2.42)	NA
≥\$20,000		
Health status		
Fair or Poor	1.52 (0.71–3.28)	NA
Excellent, Very good or Good		
Acculturation	1.03 (0.97–1.09)	NA
Shopping at Tiendas		
Always or Usually	2.39* (1.01–5.64)	1.87 (0.65–5.39)
Sometimes, Rarely or Never		
Knowledge of antibiotics and penicillin	1.02 (0.86–1.21)	NA
Perceived practical barriers to accessing health care	1.21* (1.03–1.42)	1.11 (0.91–1.37)
Documentation status as a perceived barrier to seeking health care		
Yes	2.76* (1.21–6.32)	3.02* (1.10–8.25)
No		

(Continued on p. 689)

Table 4. (continued)

Characteristic	Nonmedical Sources of Prescription Medications (Any source vs. No use)	
	OR (95% CI)	Adjusted OR (95% CI)
Fear of Immigration and Customs Enforcement officials as a barrier to seeking health care		
Yes	1.52 (0.68–3.41)	NA
No		
Provider trust	1.08 (0.92–1.28)	NA
Treated unfairly because of ethnicity		
Agree or Strongly agree	2.12* (1.01–4.47)	2.23 (0.89–5.59)
Strongly disagree or Disagree		
Experienced discrimination or been the victim of violence due to race		
Yes	1.85 (0.88–3.92)	NA
No		
Religiosity	1.05 (0.99–1.12)	NA
Mastery	1.14 (0.96–1.35)	NA
Social support	1.01 (0.98–1.05)	NA

$p < 0.05$
NA = not included in the final multivariable model
CI = Confidence Interval
OR = Odds Ratio

Furthermore, results indicated that immigrant Latinos with higher educational attainment, as opposed to those with lower educational attainment, were more likely to use non-medical sources of prescription medications. This finding may be the result of respondents with higher educational attainment perceiving that they have increased understanding of health and medicine, and thus, being more likely to self-diagnose and treat.

Limitations. This was an exploratory study and further studies are clearly warranted. The prevalence of use of non-medical sources of prescription medications may be higher than we estimated in this study. We used a conservative approach to code the use of non-medical sources of prescription medications; we only coded those medications that were listed on the assessment or by the respondent that are known to require a prescription in the U.S. Often respondents reported that they had used non-medical sources of prescription medications but when probed for detail, they named medications that do not require a prescription. Further, some respondents provided physical symptoms (e.g., backache, cough, fever) because they did not always know the name

of medications they have taken. If we had coded each respondent who reported using non-medical sources of prescription medications, the unweighted prevalence estimate would have been 45% (95% CI = 37.1–52.2); however, we realized that many respondents were unclear about the name of medication they took or could only describe symptoms that did not need a medication requiring a prescription.

Thus, future studies should include a more thorough formative phase to explore medications that are commonly used and determine which would require a prescription in the U.S. Subsequent studies then can expand the list of medications that are directly assessed and provide pictures or other descriptors for respondents to identify whether they used each medication. Additionally, since our sample was largely rural and predominately from Mexico, additional research using samples from urban areas is needed to generalize our findings. However, these findings do provide insight into a population that reflects the current trend in Latino immigration to the U.S. The Latino population has grown most dramatically in states that historically had smaller immigrant populations (among them, southeastern U.S. states).

Larger samples are needed to identify differences in the use of non-medical sources of prescription medications among subgroups of immigrant Latinos, including Latinos from different countries of origin and religious backgrounds, and of different ages. Larger samples also would provide more insight into the roles of educational attainment and time in the U.S.

Finally, these findings were based on cross-sectional data. Future studies should explore use of non-medical sources of prescription medications longitudinally to understand better cause and effect and provide guidance for intervention as warranted.

Conclusions. It is important to decrease the use of non-medical sources of prescription medications among immigrant Latinos given the potential harm of using medications that are not approved by the Food and Drug Administration, could be of poor quality, or had possible degradation of active ingredients from improper storage. Moreover, use of non-medical sources of prescription medications can lead to ongoing illness and drug resistance because medications may not be taken as indicated. Interventions could harness existing social structures that immigrant Latinos access such as *tiendas*. For example, *tienda* owners and staff could be trained to improve access to medical care and treatment by advising community members about their eligibility to use existing health care services.

At the systems level, increased bilingual and bicultural health care services are needed to ensure that immigrant Latinos have improved access to high-quality health care. However, provision of bilingual and bicultural services may not be sufficient. Access to affordable health care is required. If efforts do not address documentation status and perceived eligibility requirements as barriers to health care, undocumented immigrants, estimated to be as high as 11.5 to 12 million people (primarily from Africa, Asia, Canada, Europe, Latin America, and Mexico), may continue to rely on non-medical sources of health care and prescription medications. This might well result in harmful health outcomes.

Notes

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