Behavioral Risk Factors and Latino Body Mass Index: A Cross-Sectional Study in Missouri

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Abstract: Obesity is the fastest-growing cause of disease and death in the United States, with minority populations suffering some of the most severe consequences. Latinos constitute 16% of the U.S. population as of 2010, and have a higher proportion of the population that is overweight and obese compared with their non-Hispanic Black and White counterparts. Although there are over 15.8 million Latino residents living in non-gateway states (outside California, Texas, Arizona, Illinois, and New York), there is little research exploring obesity factors among Latinos outside of gateway states. The aim of this paper was to study socio-economic characteristics, mental health, insurance status, physical activity, and fruit and vegetable consumption, in relation to body mass index (BMI) among Latinos living in a non-gateway state. The results showed that income, employment status, marital status, insurance status, physical activity, fruit and vegetable consumption, and mental health were all associated with BMI.

Key words: Latino, obesity, BMI, overweight, Midwest.

In 2003, Surgeon General Richard Carmona described obesity as the fastest-growing cause of disease and death in the United States, with minority populations suffering some of the biggest increases and deadliest consequences.[1] Latino adults in the U.S. have a higher proportion of the population that is overweight and obese (76.9%) than non-Hispanic Whites (67.5%) and non-Hispanic Blacks (73.7%).[2] The largest increase

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in obesity in the U.S. in recent years has been among Latinos, whose obesity rates increased by nearly 80% between 1991 and 1998.[3] Research has shown that obesity is associated with heart attacks, strokes, and type 2 diabetes.[4] Obesity-related diseases account for nearly 60% of deaths in obese and overweight individuals.[1,5]

Latinos are the largest minority group, constituting about 16% of the population as of 2010,[6] with projections of 25% by 2050.[7] The latest numbers from the U.S. Census showed that there were 50,477,594 Latinos in the country in 2010. About two out of three Latinos were of Mexican descent (63%), 9% of Puerto Rican descent, 4% of Cuban descent, 3% of Dominican descent, 8% from Central America, and 5% from South America, while 8% were classified as *other Hispanic*.[8] The Latino demographic transitions taking place across the U.S. have started to affect new communities. According to the 2010 census, 15.8 million Latinos were living in non-gateway states (outside California, Texas, Arizona, Illinois, and New York), representing about 31% of the U.S. Latino population.[6] This compares with 9.5 million Latinos living in non-gateway states in 2000, representing 27% of the U.S. Latino population.[9]

Scholars have turned their attention to understanding the emergence of the Latino population in non-gateway communities.[10–13] Non-gateway states that have experienced an increase in Latino immigrant populations include Georgia, North Carolina, and Missouri. Despite this increase in scholarship, there is little research exploring obesity risk factors among Latinos in non-gateway communities. Exploring the obesity risk factors among Latinos in these new destinations is important because these communities do not have an established history of Latino settlement patterns. Latinos arriving in communities across the Midwest and so-called *Nuevo New South*[14,15] often encounter impeded access to medical care.* Access to culturally and linguistically competent health care services may be more limited for Latino residents in non-gateway states, influencing their overall health, including overweight and obesity. Changes in diet due to the availability of different foods (and sometimes the lack of traditional foods) may also influence Latino health.[16,17] Emergent Latino communities may have health clinics that serve the local population, but generally these services remain far less developed than comparable services in urban areas that have long served Latino populations.[10]

Research has shown that many risk factors (including tobacco use, alcohol intake, consumption of fruits and vegetables, and physical activity) are associated with obesity in the Latino population.[18,19] Socioeconomic status (SES) is also a major risk factor for obesity.[20–23] Although most studies use only income to demonstrate SES,[22] other scholars note that employment and marital status may also be important in understanding obesity.[21] Urban *vs.* rural residence has also been related to obesity status in previous studies.[24,25]

Physical activity is a key factor in understanding obesity among Latinos, as Latinos are less likely than other ethnic groups to engage in physical exercise.[20,25] Specifically, national data indicate that 28% of Latinos, compared with 23% of Whites, did not participate in physical activities in the month before completing the Behavioral Risk Factor Surveillance Survey.[26] Likewise a study of Latinas in the Midwest found only 36% met

*The term Nuevo New South refers to the opening of the South to a new era of economic revitalization driven by low-wage Latino immigrant labor[14] and the Latino population growth from the laborers.[15]

the current physical activity recommendation of 30 minutes of moderate activity five or more days per week or 30 minutes of vigorous activity three or more days per week.[25]

Poor nutrition also contributes to obesity among Latinos.[27–29] Some research suggests that up to 80% of Latinos do not eat the daily recommended number of fruits and vegetables.[30] Additionally, the diets of Latino children are higher in fat, sweetened beverages, and lower in fruits and vegetables than the diets of children in other ethnic groups.[31–33] However, studies have shown that that Latinos who maintain a traditional native diet (i.e., high in vegetables and fruits) have a lower risk for obesity.[27,34,35]

Mental health and obesity are associated with each other, with higher BMI associated with diagnoses of mental health disorders,[36–38] although the nature of this relationship is unclear[39] and study populations are often not representative of emerging minority populations.[36,40]

The aim of this paper was to study the relationship between socio-economic characteristics, mental health, insurance status, physical activity, and fruit and vegetable consumption with obesity levels among Latinos living in a non-gateway state. It seeks to shed light on the risk factors associated with obesity for Latinos living in Missouri. The findings will contribute to the paucity of knowledge about obesity among Latinos in Missouri, and to a more informed public health discourse for Latinos living in the Midwest. To our knowledge this study will be the first to investigate the relationship between socioeconomic characteristics, physical activities, nutrition, and obesity for Latinos in Missouri, and by extension this paper offers an opportunity to compare findings from the Latino population with the substantial amount of research conducted in more established Latino communities.

Methods

Data source. The data were collected as part of the 2007 Missouri County-level Study (CLS), which was designed to determine county-level prevalence of behavioral risk factors, chronic diseases, and preventive practices among Missouri adults. The survey was administered according to the U.S. Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS) methods and consisted of items from the BRFSS and CDC Adult Tobacco Survey. Data were collected between February 2007 and April 2008 by the University of Missouri's Health and Behavioral Risk Research Center through random-digit-dial telephone interviews conducted in English. The study response rate was 60.3%, resulting in 49,513 completed interviews. The weighted sample used in this study consisted of 974 (2%) residents who completed the CLS and identified themselves as Latino when asked during the survey administration. This percentage reflected the population of Missouri in 2000 (2.1% according to the U.S. Census).* Respondents were allowed to self-identify their ethnicity. The survey did not include questions about national origin status or immigration status. More information about the County Level Study can be found on the Missouri Department of Health and Senior Services website (http://health.mo.gov/).

*For more information about the CLS, see the Missouri Department of Health and Human Services website: http://www.dhss.mo.gov/CLS/index.html.

Measures. *Dependent variable.* Body mass index (BMI) is often used to classify individuals into categories representing healthy weight, overweight, and obese, with BMI being calculated as weight by height squared (weight/height^2). Survey participants were asked to report their weight and height, and responses were coded in terms of BMI. The average BMI was 27.9 with a standard deviation of 6.4. For the descriptive statistics in Table 1, BMI was classified into three categories: (1) healthy (18.5–24.9), (2) overweight (25.0–29.9), and (3) obese ($\geq$30).

Independent variables. This study identified several categories of variables that were examined in the statistical model. The categories included: (1) SES, (2) mental health, (3) health insurance, (4) physical activity, and (5) nutrition. All of the independent variables, with the exception of fruit and vegetable consumption variable, were used in the original measurement scale from the survey. We created a fruit and vegetable consumption variable based on the answers to six questions shown in Table 1. The definition and measurement of all of the variables used for the analyses can be found in Table 1.

Analyses. A general univariate linear equation was used to estimate two models for BMI: (1) a demographic baseline model (age, gender, income, education, marital status, employment, and geography), and a full model that includes the baseline model, mental health, health insurance, physical activity, and nutrition. We used measures of model significance (F) and model fit (adjusted-R^2) to compare the two models. Prior to model development we examined variables to determine if any were missing 10% of responses (or more) to determine possible patterns of missing values that might influence model results. The income variable was found to be the only one missing more than 10% of values. An independent samples t-test comparing mean BMI between those missing income information and those not missing income information found no significant difference ($t=1.65$; $p=.27$). Therefore, we did not include the missing category for income in the models.

Results

Demographic characteristics of Latinos. The average age of Latino Missourians was 37.0 years old, the sample was almost 55% male and nearly half were married (48.3%). The majority of the sample had at least a high school education (87.1%), was employed for wages (53.9%), and had health insurance (71.6%). Most of the sample resided in urban areas (75.1%) and 43.3% reported an income of less than $25,000 per year. On average, Latinos reported six unhealthy days per month and 28.8% of the sample stated that they did not participate in physical activity. Finally, Latinos consumed about 3.2 servings of fruits and vegetables per day. (See Table 1.)

Predictors of BMI. Table 2 presents results from the two models. Overall, Model 2 proved to be the best fit (Adjusted $R^2=0.355$) compared with Model 1 (Adjusted $R^2=0.275$). Tests of model assumptions revealed no problems with multicollinearity or heteroscedasticity.

Income was significantly associated with BMI ($F=6.723$, $p<.001$). Compared with those with an annual household income less than $15k, BMI was higher ($p<.001$) for all income groups except the highest income group. Latinos with annual incomes

Table 1.

DESCRIPTION OF VARIABLES AND DEMOGRAPHIC CHARACTERISTICS

Variable name	Survey question(s) or description	Response categories	M	SD
Body Mass Index (BMI)	The BMI was created by self-reported weight and height from open-ended questions: About how much do you weigh without shoes?; About how tall are you without shoes?	calculated	27.9	6.4
Age (yrs.)	What is your age?	open-ended	37	16
# Mentally unhealthy days	Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?	open-ended	6	10.2
Fruit & Vegetable consumption	Please answer the following questions: How often do you drink fruit juices such as orange, grapefruit or tomato? Not counting juice, how often do you eat fruit? How often do you eat green salad? How often do you eat potatoes not including French fries, fried potatoes or potato chips? How often do you eat carrots? Not counting carrots, potatoes or salad, how many servings of vegetables do you usually eat?	calculated	3.2	2.7

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Table 1. *(continued)*

Variable name	Survey question(s) or description	Response categories	n	%
BMI Category	Based on calculated BMI	Healthy (18.5–24.9)	350	37.7
		Overweight (25.0–29.9)	265	28.5
		Obese (≥30.0)	313	33.8
Gender	Not asked unless necessary	Male	532	54.6
		Female	443	45.4
Income	Is your annual household income from all sources:	<15k	78	9.1
		15k–24,999	295	34.2
		25k–34,999	122	14.2
		35k–49,999	132	15.3
		50k–74,999	132	15.3
		75k+	103	11.9
Education	What is the highest grade or year of school you completed? (open-ended)	<High School	126	12.9
		High School	469	48.1
		Some College	233	23.9
		College Grad	147	15.1
Marital status	Are you: Married, Divorced, Widowed, Separated, Never married, or a member of an unmarried couple?	Married	466	48.3
		Divorced	64	6.6
		Widowed	72	7.5
		Separated	35	3.6
		Never married	259	26.9
		Unmarried couple	69	7.1

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Table 1. *(continued)*

Variable name	Survey question(s) or description	Response categories	n	%
Employment status	Are you currently: Employed for wages, self-employed, out of work for more than 1 year, out of work for less than 1 year, a homemaker, a student, retired, or unable to work?	Employed for wages	524	53.9
		Self-employed	71	7.3
		Out of work + 1 vear	33	3.4
		Out of work <1 year	68	7
		Homemaker	63	6.5
		Student	49	5
		Retired	68	7
		Unable to work	95	9.8
Geography	Based on zip code and classified by urban-rural commuting codes (http://depts.washington.edu/uwruca/)	Urban	729	75.1
		Rural	242	24.9
Has Health insurance	Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?	Yes	692	71.6
		No	274	28.4
Physical activity	During the past month, other than your regular job, did you participate in any physical activities or exercise such as running, calisthenics, golf, gardening, or walking for exercise?	Yes	694	71.2
		No	280	28.8

Source: 2007 Missouri County-level Study. Table created by Authors.

greater than or equal to $75,000 did not have statistically significantly different BMIs from those with incomes less than $15,000 ($b=-0.646$, $p=.525$). Marital status ($F=11.970$, $p<.001$) was also associated with BMI. Compared with people who were married, people who were divorced, never married, or part of an unmarried couple demonstrated a lower BMI ($b=-2.057$, $p=.019$; $b=1.680$, $p=.006$; $b=-5.298$, $p<.001$, respectively). Latinos who were widowed demonstrated a higher BMI than those who were married ($b=3.616$, $p<.001$) and there was no statistically significant difference in BMI between those who were married and those who were separated ($b=-1.650$, $p=.190$). Employment status ($F=7.670$, $p<.001$) was also associated with BMI. Compared with those who were employed for wages, those who were out of work for less than a year and those who were students demonstrated a lower BMI ($b=-3.610$, $p<.001$; $b=-3.707$, $p=.001$, respectively). Latinos out of work for more than one year, who were retired, or who were unable to work had BMIs greater than those who were employed for wages ($b=2.738$, $p=.016$; $b=2.238$, $p=.036$; $b=3.397$, $p<.001$, respectively). Latinos who were self-employed or who were homemakers demonstrated no statistically significant difference in BMI compared with those who were employed for wages ($b=-.336$, $p=.656$; $b=-1.325$, $p=.174$, respectively).

Mental health ($F=31.337$, $p<.001$) demonstrated a small, but statistically significant, effect on BMI ($b=0.136$, $p<.001$). Physical activity ($F=17.647$, $p<.001$) was associated with a lower BMI ($b=-2.156$, $p<.001$). The consumption of fruits or vegetables ($F=9.355$; $p=.002$) was predictive of a lower BMI ($b=-.239$; $p=.002$). Finally, Latinos with health insurance ($F=4.485$; $p=.035$) had lower BMI levels ($b=-1.036$; $p=.035$).

Discussion

This article offers insight into BMI levels for the Latino population in a non-gateway state, and it provides a baseline to begin to study health changes, as the Latino population continues to grow. At the outset of this paper, we made the distinction between Latinos living in a gateway and a non-gateway state and the need to determine empirically if the health outcomes were similar or different. Our results are mixed. We find that some risk factors (i.e., physical activity, nutrition) associated with BMI for Latinos in Missouri were consistent with other research findings for the Latino population at the national level or in gateway destination states.[41,42] However, we also discovered some divergence in our findings (specifically, concerning the relationships between insurance status and income with BMI).

The results suggest that income, employment status, marital status, insurance status, physical activity, fruit and vegetable consumption, and mental health were associated with BMI. We found BMI to have a positive relationship with income, which is not unusual in Latino populations.[43,44] Overweight status among Latino children may be indicative of a higher parental socio-economic status in some Latin American countries,[20] and higher national incomes are associated with higher obesity rates in Latin American countries.[45,46] In addition, Latino youth in the U.S. who have a lower level of cultural adaptation are less likely to become obese, even if they are at a lower SES.[20,47]

Employment status was significantly associated with BMI. Compared with being currently employed, recently unemployed Latinos had a significantly lower BMI, and

Table 2.

GENERAL UNIVARIATE LINEAR REGRESSION RESULTS FOR LATINO BMI

	Model 1—Baseline Model					Model 2—Full Model				
Parameter	**B**	**Std. Error**	**Sig.**	**F**	**p**	**B**	**Std. Error**	**Sig.**	**F**	**p**
Demographics										
Age	−0.014	0.020	0.491	0.475	.491	−0.037	0.020	0.063	3.469	.063
Male	−0.397	0.477	0.406	0.691	.406	−0.151	0.458	0.741	0.109	.741
Income										
>15k	—	—	—	6.122	<.001	—	—	—	6.723	<.001
15k–24,999	2.030	0.842	0.016			2.129	0.800	0.008		
25k–34,999	1.818	0.951	0.056			2.431	0.905	0.007		
35k–49,999	2.217	1.030	0.032			2.535	0.979	0.010		
50k–74,999	2.962	1.004	0.003			2.912	0.964	0.003		
75k+	−0.847	1.053	0.422			−0.646	1.017	0.525		
Educaction										
> High School	0.960	0.747	0.199	1.165	.322	0.844	0.731	0.248	0.620	.602
High School	—	—	—			—	—	—		
Some College	−0.129	0.598	0.830			0.546	0.586	0.352		
College Grad	−0.695	0.704	0.324			0.317	0.678	0.640		
Marital status										
Married	—	—	—	10.350	<.001	—	—	—	11.970	<.001
Divorced	−1.948	0.924	0.035			−2.057	0.875	0.019		
Widowed	4.299	1.042	<.001			3.616	1.043	0.001		
Separated	−1.797	1.327	0.176			−1.650	1.259	0.190		
Never married	−1.244	0.634	0.050			−1.680	0.604	0.006		
Unmarried couple	4.196	1.042	<.001			−5.298	0.991	<.001		

(Continued on p. 1759)

Table 2. *(continued)*

Parameter	Model 1—Baseline Model					Model 2—Full Model				
	B	Std. Error	Sig.	F	p	B	Std. Error	Sig.	F	p
Employment status										
Employed for wages	—	—	—	8.876	<.001	—	—	—	7.670	<.001
Self-employed	−0.146	0.787	0.853			−0.336	0.754	0.656		
Out of work +1 year	3.478	1.196	0.004			2.738	1.137	0.016		
Out of work 1 year	−2.415	0.940	0.010			−3.610	0.930	<.001		
Homemaker	−1.395	1.025	0.174			−1.325	0.974	0.174		
Student	−3.252	1.136	0.004			−3.707	1.075	0.001		
Retired	0.679	1.105	0.539			2.238	1.063	0.036		
Unable to work	5.718	0.958	<.001			3.397	0.953	<.001		
Rural residence	0.093	0.503	0.854	0.034	.854	0.576	0.481	0.231	1.435	.231
Risk Factors										
# Mentally unhealthy days						0.136	0.024	<.001	31.337	<.001
Has Health insurance						−1.036	0.489	0.035	4.485	.035
Does Physical activity						−2.156	0.513	<.001	17.647	<.001
# of Fruit & Vegetable servings						−0.239	0.078	0.002	9.355	.002
Intercept	27.187	1.398	<.001			30.198	1.459	<.001		
Model F			13.663					16.511		
Model p			<.001					<.001		
R^2			0.297					0.378		
Adjusted R^2			0.275					0.355		

Source: 2007 Missouri County-level Study. Table created by Authors.

those unemployed for a longer term had a significantly higher BMI. Several studies have identified associations between unemployment and BMI.[21,48–50] In general, unemployment is associated with higher BMI for women and lower BMI for men.[21,49,50] In international studies, evidence related to BMI and duration of unemployment is mixed.[49,51] The relationship between gender, unemployment, and BMI is unclear in the U.S. Latino population and may be worth further exploration.

Prior research from several studies of different groups (Latino and non-Latino) in America has found that individuals who were married had higher BMI than most other marital status categories.[52,53] The and Gordon-Larsen suggest that a shared household environment increases the risk of obesity because the married household is at a higher risk of producing environments that are conducive to physical inactivity and sedentary behavior.[52] However, research also shows a ripple effect, where a spouse's weight loss has a positive impact on his or her spouse's weight loss.[53] The net result is that individuals who adopt a healthier lifestyle spreads this lifestyle change to their spouses, which could be an alternative solution to the weight-gain-after-marriage thesis posited in previous studies.[54,55]

Health insurance status was also associated with BMI, with insured individuals having lower BMI levels. This finding was not consistent with the previous studies utilizing large nationally representative datasets that found that individuals with health insurance had higher levels of BMI.[56] However, our findings were in accord with studies that focus on Latino health status.[42,57,58] Latinos with no health insurance may not have access to the appropriate medical personnel or treatment facilities that can offer assistance or medication for weight management issues.[57] Furthermore, Latinos immigrants who have had limited opportunity for cultural adaptation for medical treatment offered in the U.S may not be able to access information about health care insurance because of cultural and linguistic barriers.[42,57]

Physical inactivity was a significant predictor of BMI for Latinos. Research demonstrates that Latinos do not participate in adequate physical activity.[59,60] Studies also show that Latino immigrants are more physically active compared with native born Latinos.[61,62] However, as immigrants become more acculturated to a U.S. sedentary lifestyle and adopt unhealthy behaviors, their risk for obesity increases.[63] Finally, lack of physical activity may be related to the high number of hours worked by Latinos in the U.S., and inadequate sleep due to overscheduled workdays.[64–66] With fewer hours available because of multiple jobs, demanding household tasks, and long commutes, individuals simply do not have the extra time for physical activity.[66]

Research shows that the U.S. Latino diet is deficient in fruits and vegetables,[16] and suggests that cultural adaptation is one of the most important factors that may explain the low-level of consumption of fruits and vegetables.[17,19] There are two important dimensions of cultural adaptation that affect diets: (1) fast-food consumption,[67] and (2) dietary changes.[68,69] The evidence is mixed regarding fast-food consumption and cultural adaption. However, one study did find that second generation Mexican Americans were more likely to consume fast food and snacks high in fat compared with their parents.[69] Dietary changes require access to affordable fruits and vegetables. Latino families that struggle to make ends meet or live in neighborhoods where access to fruits and vegetables is limited may find it challenging to buy fruits and vegetables.[68,70–72]

The findings also reveal that Latinos who reported mentally unhealthy days in the last month were more likely to have high BMI scores. This finding is consistent with studies that found a robust relationship with depressive disorders and obesity.[36–39,73–77] Although this relationship is well documented, it is complex and not fully understood.[36,39,74,78–81]

Latinos residing in Missouri live and work in a different socio-ecological environment from Latinos in gateway destination states, which may have a differential effect on quality of life, stress, and health outcomes. The relationship between physical activity, fruit and vegetable consumption, and BMI was consistent with research finding for Latinos in California and are consistent with findings for the general population.[5,42] However, there were some noticeable differences. For example, the Latino population in Missouri was slightly more likely to report that they had health insurance compared with a study for the Latino population in California.[42] Our results showed that health insurance had a significant effect on BMI, whereas a study conducted among Latinos in California, showed a similar effect only with Central American males.[42] Moreover, some of the findings regarding socio-demographic characteristics produced differences. In our study, income was a significant predictor of BMI, but this relationship was not significant in research findings that focused on Latino obesity at the national level.[82]

Limitations. This study has two primary limitations. First, the analysis presented in this paper is based on cross-sectional data. Longitudinal data would allow for a more sophisticated analysis that would augment the findings in this study. Second, there were no variables on language fluency, immigration status, generational status, or cultural adaptation. This limitation is commonly found in studies on Latinos. Latinos are a heterogeneous group in terms of their ethnicity, race, citizenship status, and language fluency. Variables that measure immigration status, generational status, or cultural adaptation improve our understanding of Latino health characteristics in the U.S.[19,62] For example, different attitudes towards weight by Latino citizens *versus* Latino non-citizens about body size may contribute to obesity.[83] Moreover, other factors (such as nation-of-origin, length of time in the U.S., language fluency) may help explain the variation in obesity levels among Latinos.[18]

Diversity within the Latino ethnic category generates three implications for public health policy and practice. First, the analysis of aggregate data for the diverse and distinctive Latino population should be performed with caution. Researchers and policymakers must acknowledge that findings from an aggregate ethnic category (i.e., Latino or Hispanic)—although helpful—conceal differences within the category. With the increase diversity of the Latino population it will be even more important that policymakers, practitioners, and researchers design interventions and treatments that are appropriate for the sub-populations that constituted the Latino ethnic category. Second, there is an urgent need to consider new models of measurement that accurately measure the diversity of the Latino population.[84] Researchers must incorporate more questions into the health surveillance surveys designed to parse the Latino populations into more accurate units of analysis for etiological analysis.[85] The etiological factors for health outcomes for a fourth generation Mexican American male may differ from those for health outcomes for a first generation Mexican American male. Giving researchers and policymakers the ability to make such distinctions may improve medical treatment and overall quality of life. Third, training medical professionals to have a greater

awareness of the diversity within the U.S. Latino ethnic category will increase their cultural competency to treat risk factors for diseases and to develop interventions that are conducive to the cultural beliefs of the patients.[84,86]

Conclusions. Latinos, the fastest-growing large U.S. ethnic group, are increasingly living in states that historically have not had significant Latino populations, presenting a new public health challenge in non-gateway states. Although the prevalence of obesity among Latino adults has been on the rise in recent years,[2] few studies have examined the risk factors associated with the prevalence of obesity in emergent Latino populations in the Midwest. As the first study to focus on Latino BMI in the state of Missouri and as it is among one of the very few studies to examine Latino obesity outside a Latino gateway state, this study fills important gaps in the existing literature on Latino obesity in the Midwest. First, it shows that socioeconomic characteristics measured by income, marital status, and employment status were associated with BMI. Second, this study also showed that risk factors measured by insurance status, fruit and vegetable consumption, mental health, and physical activity were also associated with BMI. Further longitudinal obesity research in non-gateway states must explore the effects of immigration status, country of origin, generational status, and cohort status. The addition of these variables would provide information that would help health practitioners develop culturally sensitive interventions to reduce obesity among Latinos living in Missouri.

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