RESEARCH
Original Research: Brief

Cognitive Factors Associated with Frequency of Eating Out and Eating Takeout among Latinas

Samantha Garcia, MPH; Connie Valencia, MPH; Hortensia Amaro, PhD, MA

ARTICLE INFORMATION

Keywords:
Eating out
Mindfulness
Diet
Latina
Obesity

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https://doi.org/10.1016/j.jand.2020.08.089

ABSTRACT

Higher frequency of eating outside the home can be an unhealthy behavior that may contribute to higher rates of obesity among Latinas, a disproportionately affected group. There is a growing need to understand potentially modifiable factors (eg, dispositional mindfulness, self-efficacy, nutrition knowledge) associated with higher frequency of eating outside the home in this population. This study assessed associations of cognitive factors (ie, dispositional mindfulness, self-efficacy of eating and purchasing healthy foods, nutrition knowledge) with frequency of eating out among Latinas. A secondary analysis was performed of data from a cross-sectional study of Latinas between February and May 2015. The study comprised a convenience sample of 218 Spanish- or English-literate Latinas, between the ages of 18 and 55 years, who lived in South or East Los Angeles and self-identified as the primary person responsible for grocery shopping in the household. Most participants identified as foreign-born Mexican Americans. Frequency of eating out was assessed as the outcome variable, and three cognitive variables (mindfulness disposition, self-efficacy, nutrition knowledge) served as independent variables. Multinomial models assessed the association between cognitive factors and frequency of eating out. Models were adjusted for age, English-speaking ability, income, having an obesity-related disease (ie, overweight or obesity, diabetes, high blood pressure, cardiovascular disease), household size, and education level. For every 1-unit increase in mindfulness disposition, the risk of a participant eating out every week compared with every month decreased by a factor of 0.42 (relative risk ratio [RRR] = 0.58, $P < 0.01$). For every 1-unit increase in self-efficacy, the risk of a participant eating out every week compared with every month decreased by a factor of 0.32 (RRR = 0.68, $P < 0.05$), and the risk of a participant eating out every 2 weeks compared with every month decreased by a factor of 0.44 (RRR = 0.56, $P < 0.05$). For every 1-unit increase in nutrition knowledge, the risk of a participant eating out every week compared with every month increased by a factor of 1.42 (RRR = 1.42, $P < 0.01$). Lower dispositional mindfulness was associated with higher frequency of eating out when comparing individuals who ate out at least every week with those who ate out once a month or less or every 2 weeks. Lower self-efficacy was associated with eating out more when comparing those who ate out once a month or less with those who ate out at least every week or every 2 weeks. Lower nutrition knowledge was associated with lower frequency of eating out for participants who ate out once a month or less compared with those who ate out at least every week.
J Acad Nutr Diet. 2021;121(3):520-528.

OBESITY IS A MAJOR PUBLIC HEALTH PROBLEM among Latinos, who constitute more than 18% of the US population and are the largest minority group in the United States.[1] Mexican Americans, the largest US Latino group, have among the highest rates of obesity, especially among women. Between 2013 and 2016, age-adjusted estimates of overweight or obesity among women older than 20 years were 64.6% for non-Latina Whites, 78.8% for Latinas, and 84.5% for Mexican Americans.[2] Although various risk factors have exacerbated the obesity epidemic, food consumption behaviors may be predominant determinants of obesity rates.[3]

Eating outside the home is on the rise, accounting for nearly half of US household food expense[4] and creating a need to understand risk factors associate with eating out and increased food consumption outside the home.[4,5] Meals at food venues tend to have higher caloric content, bigger portion sizes, and unhealthy food choices compared with meals at home.[6,7] Eating at fast-food and full-service restaurants has been linked to increased consumption of

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calories, sugar, saturated fats, and sodium,[8] which may have negative consequences for health status if consumed excessively.[9-11] Consequently, the frequency of eating out has been linked to adverse health outcomes such as prehypertension or hypertension[12] and a higher prevalence of overweight and obesity.[5] Frequency of fast food consumption among Latinas remains underexplored.[13]

Social cognitive theory (SCT) emphasizes the important role of cognitive processes in behavior.[14] In SCT, a person weighs cognitive, social, and environmental factors before motivation turns into action. Cognitive processing requires individuals to draw on their state of knowledge to be aware of a behavior and have a sense of self-efficacy to perform the behavior.[15] Studies of primarily non-Latino samples have found cognitive factors (eg, mindfulness, self-efficacy) to be associated with food consumption behaviors (eg, emotional eating, overeating, preparing meals at home, percentage of calories from nutritious foods).[16-19] Dispositional mindfulness is considered an individual capacity characterized by a focused, nonevaluative attention to and awareness of current events.[20,21] A systematic review found that dispositional mindfulness is associated with lower disordered eating.[22] Self-efficacy may be another important cognitive factor associated with frequency of eating out, including an association with healthier food choices.[18,19,23] Self-efficacy of meal management (eg, meal planning, choosing healthy and nutritious foods at the grocery store, cooking for the family) may be associated with healthier home-based food behaviors.[18] The literature on associations between nutrition knowledge and healthy food consumption behaviors[24] has yielded conflicting findings. These associations may depend on various factors (eg, group studied, nutrition knowledge assessment tool used, diet-related outcomes examined).[20,24,25] More work is needed to assess the relationship between cognitive factors and frequency of eating out among Latinas.

This study used baseline data from a convenience sample of Latina adults. Participants were primarily of Mexican American heritage and recruited from environments with lower access to healthy foods and high access to unhealthy food options.[26,27] In the context of upstream factors that limit healthy food availability, individual factors were explored that may be associated with frequency of eating out. This study sought to address a gap in the literature by investigating whether potentially modifiable cognitive factors of dispositional mindfulness, self-efficacy, and nutrition knowledge are associated with frequency of eating out among participants. In this paper, frequency of eating out includes frequency of eating takeout.

The study's hypotheses included the following: (1) Lower mindfulness will be associated with higher frequency of eating out; (2) Lower self-efficacy related to eating and purchasing healthy foods will be associated with higher frequency of eating out; and (3) Lower nutrition knowledge will be associated with higher frequency of eating out.

RESEARCH SNAPSHOT

Research Question: Are mindfulness disposition, self-efficacy, and nutrition knowledge associated with frequency of eating out and eating takeout among Latinas?

Key Findings: This cross-sectional observational study enrolled 218 Latinas recruited from Head Start programs and churches in Los Angeles, California. Multinomial models were used to compute relative risk ratios (RRR). For every 1-unit increase in mindfulness disposition, the risk of a participant eating out every week compared with every month decreased by a factor of 0.42 (RRR = 0.58, $P < 0.01$). For every 1-unit increase in self-efficacy, the risk of a participant eating out every week compared with every month decreased by a factor of 0.32 (RRR = 0.68, $P < 0.05$) and the risk of a participant eating out every 2 weeks compared with every month decreased by a factor of 0.44 (RRR = 0.56, $P < 0.05$). For every 1-unit increase in nutrition knowledge, the risk of a participant eating out every week compared with every month increased by a factor of 1.42 (RRR = 1.42, $P < 0.01$).

METHODS

Data

Dataset. This study involved secondary analyses of cross-sectional data from baseline surveys completed by Latinas in South and East Los Angeles.[28] The parent study employed convenience sampling to recruit adult women who are the food-shopping gatekeepers in the household. Participants were sampled from two communities with a high proportion of lower-income Mexican American households,[26] lower access to grocery stores, and a high density of fast-food restaurants.[26,27] The study was deemed exempt by the [blinded for review] Institutional Review Board. Participants in the parent study provided verbal consent, and the study protocol received review board approval.

Procedures. From February to May 2015, women were recruited from Head Start programs via Head Start program directors and from churches via recruitment presentations during Sunday services. Eligibility criteria included being Spanish- or English-literate Latinas, between the ages of 18 and 55 years, living in South or East Los Angeles, and self-identifying as the primary person responsible for household grocery shopping. Potential participants were screened via phone, and those who met study criteria were invited to participate in a nutritional video intervention.[28] Eligible participants were notified of the location, date, and time of the study, during which a bilingual–bicultural staff member orally administered paper-and-pencil surveys to 218 participants in their preferred language before the intervention. Analyses for the current paper were based on baseline data collected before the intervention from the convenience sample of participants of the parent study, and thus intervention effects are not relevant to this paper. Results on intervention effects were reported in a previous publication.[28]

Variables. The dependent variable was frequency of eating out: "On average, how many times a week does your family eat out or eat takeout?" Items were measured on a 6-point scale: (1) *every day*, (2) *a few times a week*, (3) *every week*, (4) *every two weeks*, (5) *once a month*, and (6) *less than monthly*. Because of few responses, "every day," "a few times a week," and "every week" were collapsed to create "at least

every week." Responses of "once a month" and "less than monthly" were collapsed to create "once a month or less." Next, responses were reverse coded, so that higher values reflected greater frequency of eating out. The final outcome variable was coded as (1) *once a month or less*, (2) *every two weeks*, and (3) *at least every week*. Response categories were informed by past work indicating lower frequency of eating out among lower-income populations[29] and accounted for potentially varying levels of eating out based on acculturation.[30]

Cognitive factors were explored to determine their association with frequency of eating out. The mindfulness construct was measured using the Mindfulness Attention Awareness Scale,[31] which has psychometric validation.[32] Internal reliability in this sample was 0.91, reflecting high internal consistency. The 15-item scale measures a participant's receptive state of mind, using Likert-style questions with response options ranging from 1 (*almost always*) to 6 (*almost never*). Mean scores were computed, wherein higher scores indicated higher levels of dispositional mindfulness. Example items are: "I break or spill things because of carelessness, not paying attention, or thinking of something else" and "I snack without being aware that I'm eating."

The second cognitive variable was self-efficacy of healthy food consumption and purchasing behaviors measured with the Self-Efficacy of Eating and Purchasing Healthy Foods Scale.[33] This variable featured 24 items, with responses ranging from 1 (*not at all confident*) to 5 (*very confident*). The overall scale internal reliability was 0.91, reflecting high internal reliability. Mean scores were computed, with higher scores indicating higher self-efficacy to eat and purchase healthy foods.

The last cognitive variable was nutrition knowledge, measured using five true-or-false questions assessing knowledge of MyPlate recommendations outlined in *Dietary Guidelines for Americans 2015*.[34] Selected nutrition knowledge questions were used in previous studies[28,35] to assess nutrition knowledge among Spanish-speaking women. Items were: (a) When shopping for grains, it is better to choose whole-wheat grains; (b) Frozen vegetables are not included in the MyPlate Method; (c) Fish, meat, and chicken can be included in the protein section of the MyPlate Method; (d) Pasta and bread can be included in the grains section of the MyPlate Method; and (e) Yogurt, cheese, and butter can be included in the dairy section of the MyPlate Method. Correct answers were summed, creating scores ranging from 0 to 5. Higher scores indicated higher nutrition knowledge.

Covariates included household income, educational attainment, English-speaking ability, having an obesity-related disease (ie, diabetes, obese or overweight, heart disease, high blood pressure), household size, and age. Income was assessed by asking, "What is the monthly income for your household?" Response options were (1) less than $500; (2) $500–$700; (3) $701–$900; (4) $901–$1,100; (5) $1,101–$1,300; (6) $1,301–$1,500; and (7) more than $1,500. Education level was a dichotomous variable (0 = less than high school diploma, 1 = high school diploma or higher). Language ability was assessed by asking participants, "Do you speak: (1) only Spanish; (2) mostly Spanish; (3) both English and Spanish; (4) mostly English; and (5) only English?" To capture language ability, responses were collapsed into Spanish-dominant (responses of "only Spanish" or "mostly Spanish"; coded as 0) and English-speaking ability (responses of "both English and Spanish," "mostly English," or "only English"; coded as 1). Having an obesity-related disease was captured by asking, "Has anyone in your family been told by a doctor that they: (a) have diabetes; (b) are obese or overweight; (c) have heart disease; (d) have high blood pressure? Circle all that apply." Participants were then asked to indicate who in their family had an obesity-related disease. Responses for self were tabulated (0 = respondent does not have an obesity-related disease, and 1 = respondent has at least one obesity-related disease). Household size was determined by asking, "How many people live in your house, including you?" Numeric responses were provided by participants. Age was collected by asking participants to write down their age in years.

Statistical Analysis

All analyses were conducted using Stata software (Version 15.1, 2017, StataCorp, College Station, TX).[36] Variables were screened for extreme values. Higher outliers identified in the covariate household size were within the possible range and kept in the analyses because it is common to have a multifamily structure in one household. Variance inflation factor and tolerance values were computed to verify no signs of potential multicollinearity between independent variables and covariates in the models. Means and standard deviations (mean ± SD) of participant characteristics were calculated. Associations between frequency of eating out response categories and participant characteristics were tested using nonparametric Kruskal-Wallis tests for continuous variables and χ^2 tests for categorical variables. Missing data were handled using multiple imputation by chained equations with 20 iterations. Data were imputed for variables with <1% to 16% of missing data. Ordinal logistic regression was not used because the proportional odds assumption for ordered logit models was not met. To assess the association between cognitive factors and frequency of eating out, multinomial logistic regressions models were computed to estimate relative risk ratios (RRR) for each cognitive factor, controlling for individual factors. The *mlogit* command that produces RRR in Stata is appropriate for cross-sectional data.[37] RRR represents the ratio of the probability a participant selected an outcome category (eg, at least every week, every 2 weeks) over the probability of choosing the referent category (eg, once a month or less). Supplemental analysis in which models were recoded with a referent group of "every 2 weeks" were conducted to capture all possible pairwise comparisons. An example of the computed model is as follows.

$$\begin{aligned}\ln\left(\frac{P(\textit{Frequency of eating out} = \textit{At least every week})}{P(\textit{Frequency of eating out} = \textit{Once a month or less})}\right) &= \alpha + b_1(\textit{cognitive factor}) + b_2(\textit{income}) \\ &+ b_3(\textit{high school diploma or greater}) \\ &+ b_4(\textit{English speaking ability}) \\ &+ b_5(\textit{obesity} - \textit{related disease}) \\ &+ b_6(\textit{household size}) + b_7(\textit{age})\end{aligned}$$

In this equation, *cognitive factor* represents the variables of dispositional mindfulness, self-efficacy, and nutrition knowledge, which were run separately in the models.

Table 1. Characteristics by frequency of eating out or eating takeout in a convenience sample of 218 Latinas from Los Angeles, CA[a]

	Sample total (N = 218)	Once a month or less (n = 75)	Every 2 weeks (n = 38)	At least every week (n = 99)	χ^2 (*P*)
Language,[b] n (%)					3.87 (0.15)
Only Spanish or mostly Spanish	146 (67.0)	52 (69.3)	29 (76.3)	59 (59.6)	
English speaking ability	70 (32.1)	22 (29.3)	9 (23.7)	39 (39.4)	
Missing	2 (1)	1 (1.4)	0	1 (1)	
Education,[c] n (%)					4.13 (0.13)
Less than high school diploma	100 (45.9)	41 (54.7)	14 (36.8)	40 (40.4)	
High school diploma	115 (52.3)	34 (45.3)	23 (60.5)	57 (57.6)	
Missing	3 (1.4)	0	1 (2.6)	1 (1)	
Monthly household income, n (%)					5.55 (0.06)
Less than $500	21 (9.6)	9 (12.0)	1 (2.6)	10 (10.1)	
$500—$700	19 (8.7)	10 (13.3)	6 (15.8)	3 (3.0)	
$701—$900	16 (7.3)	7 (9.3)	2 (5.2)	6 (6.1)	
$901—$1,100	29 (13.3)	14 (18.7)	5 (13.2)	10 (10.1)	
$1,101—$1,300	24 (11.0)	7 (9.3)	5 (13.2)	10 (10.1)	
$1,301—$1,500	24 (11.0)	7 (9.3)	5 (13.2)	12 (12.1)	
More than $1,500	50 (22.9)	17 (22.7)	7 (18.4)	28 (28.3)	
Missing	35 (16.1)	6 (8.0)	7 (18.4)	20 (20.2)	
Place of birth,[d] n (%)					1.83 (0.40)
United States	39 (17.9)	11 (14.7)	6 (15.8)	22 (22.2)	
Mexico	133 (61.0)	44 (58.7)	27 (71.1)	59 (59.6)	
El Salvador	27 (12.4)	12 (16.0)	4 (10.5)	10 (10.1)	
Guatemala	13 (6.0)	6 (8.0)	1 (2.6)	4 (4.0)	
Honduras	3 (1.4)	1 (1.3)	0	2 (2.0)	
Peru	1 (< 1)	0	0	1 (1.0)	
Missing	2 (1)	1 (1.3)	0	3 (3.0)	
Age (years), mean ± SD	39.3 ± 9.98	40.9 ± 9.98	45.8 ± 9.6	39.1 ± 9.6	7.02 (0.03)
Missing	1 (0.47)	0	1 (2.6)	0	
Household size, n (%)	4.49 (1.7)	4.3(1.5)	4.4 (1.9)	4.7 (1.8)	4.18 (0.12)
Missing	0	0	0	0	
Having an obesity-related disease, n (%)	62 (28.4)	26 (34.7)	8 (21.1)	28 (28.3)	3.4 (0.18)
No obesity-related disease, n (%)	148 (67.9)	43 (57.3)	30 (78.9)	69 (69.7)	

(*continued on next page*)

Table 1. Characteristics by frequency of eating out or eating takeout in a convenience sample of 218 Latinas from Los Angeles, CA[a] (*continued*)

	Sample total (N = 218)	Once a month or less (n = 75)	Every 2 weeks (n = 38)	At least every week (n = 99)	χ^2 (*P*)
Missing	8 (3.7)	6 (8)	0	2 (2.0)	
Mindfulness,[e] mean ± SD	4.6 ± 1.06	4.8 ± 0.95	4.86 ± 0.77	4.3 ± 1.18	8.34 (0.02)
Missing	1 (< 1)	0	0	1 (< 1)	
Self-efficacy,[f] mean ± SD	3.5 ± 0.69	3.6 ± 0.67	3.4 ± 0.62	3.4 ± 0.71	5.82 (0.05)
Missing	1 (< 1)	1 (< 1)	0	0	
Nutrition knowledge,[g] mean ± SD	3.6 ± 1.08	3.5 ± 1.10	3.7 ± 1.05	3.9 ± 1.07	6.94 (0.03)
Missing	1 (< 1)	0	0	1 (< 1)	

[a]Results reflect two-tailed significance test from Kruskal-Wallis and χ^2 tests.
[b]Language was coded as 0 for Spanish dominant (responses of "only Spanish" or "mostly Spanish"); and 1 for English-speaking ability (responses of "both English and Spanish," "mostly English," or "only English").
[c]Education coded as (0) less than high school diploma or (1) high school diploma or GED or higher.
[d]Place of birth coded as (0) foreign born or (1) US born.
[e]Mindfulness Attention Awareness Scale,[31] with 16 items and responses ranging from 1 (*almost always*) to 6 (*almost never*). Mean scores were computed. Higher scores indicated higher levels of dispositional mindfulness.
[f]Self-Efficacy of Eating and Purchasing Healthy Foods Scale,[33] with 24 items and responses ranging from 1 (*not at all confident*) to 5 (*very confident*). Mean scores were computed. Higher scores reflect higher self-efficacy.
[g]Nutrition knowledge was measured by five true-or-false questions related to US Department of Agriculture MyPlate guidelines. Correct responses were summed, with higher scores indicating higher nutrition knowledge.

For all tests, a two-tailed value of $P < 0.05$ was considered statistically significant. Pooled estimates of 20 imputed datasets and robust standard errors are reported. Analyses were conducted on both original and imputed data to ensure that significant findings did not differ.

RESULTS

Ninety-nine women (45%) reported eating out weekly or more, 38 participants (17%) reported eating out every 2 weeks, and 75 participants (34%) reported eating out once a month or less. The average age of participants was 39.3 ± 10 years. Many participants were born in Mexico (61%) and predominantly spoke Spanish (67%). Participants' age varied significantly by frequency of eating out. Table 1 presents the sample characteristics of 218 Latinas reported by frequency of eating out.

For every 1-unit increase in mindfulness disposition, the risk of a participant eating out at least every week compared with every month decreased by a factor of 0.42 (RRR = 0.58, $P < 0.01$), whereas the risk of a participant eating out every 2 weeks compared with every month did not significantly differ (RRR = 1.00, $P = 0.99$). For every 1-unit increase in mindfulness disposition, the risk of a participant eating out at least every week compared with every 2 weeks decreased by a factor of 0.42 (RRR = 0.58, $P < 0.05$). In other words, when compared with those who ate out once a month or less, the risk of eating out at least every week decreased as mindfulness disposition scores increased. When compared with those who ate out every 2 weeks, the risk of eating out at least every week decreased as mindfulness disposition scores increased.

For every 1-unit increase in self-efficacy, the risk of a participant eating out every week compared with every month decreased by a factor of 0.32 (RRR = 0.68, $P < 0.05$), and the risk of a participant eating out every 2 weeks compared with every month decreased by a factor of 0.44 (RRR = 0.56, $P < 0.05$). For every 1-unit increase in self-efficacy, the risk of a participant eating out at least once a week compared with every 2 weeks did not significantly differ (RRR = 1.20, $P = 0.35$). When compared with those who ate out once a month or less, the risk of eating out every 2 weeks and the risk of eating out once a month or less decreased as self-efficacy increased.

For every 1-unit increase in nutrition knowledge, the risk of a participant eating out every week compared with every month increased by a factor of 1.42 (RRR = 1.42, $P < 0.01$), whereas the risk of a participant eating out every 2 weeks compared with every month did not significantly differ (RRR = 1.16, $P = 0.44$). For every 1-unit increase in nutrition knowledge, the risk of a participant eating out at least every week compared with participants eating out every 2 weeks did not significantly differ (RRR = 1.23, $P = 0.30$). In other words, when compared with those who ate out once a month or less, the risk of eating out at least every week increased as nutrition knowledge scores increased.

Table 2 shows results of multinomial logistic regressions testing associations between cognitive variables and frequency of eating out after controlling for demographic characteristics, with "once a month" as the referent group.

Table 2. Associations between cognitive factors and frequency of eating out or eating takeout in a convenience sample of 218 Latinas from Los Angeles, CA[a]

Outcome	Mindfulness[b] RRR[e] (95% CI)	Self-efficacy[c] RRR[e] (95% CI)	Nutrition knowledge[d] RRR[e] (95% CI)
Frequency of eating out[f]			
Once a month or less	Referent	Referent	Referent
Every 2 weeks	1.00 (0.62, 1.62)	0.56* (0.35, 0.89)	1.16 (0.78, 1.71)
At least once a week	0.58** (0.40, 0.83)	0.68* (0.47, 0.98)	1.42* (1.03, 1.98)

[a]Results reflect two-tailed significance test values from multinomial logistic regressions.
[b]Mindfulness Attention Awareness Scale,[31] with 16 items and responses ranging from 1 (*almost always*) to 6 (*almost never*). Mean scores were computed. Higher scores indicated higher levels of dispositional mindfulness.
[c]Self-Efficacy of Eating and Purchasing Healthy Foods Scale,[33] with 24 items and responses ranging from 1 (*not at all confident*) to 5 (*very confident*). Mean scores were computed. Higher scores reflect higher self-efficacy.
[d]Nutrition knowledge was measured by five true-or-false questions related to US Department of Agriculture MyPlate guidelines, with higher scores indicating higher nutrition knowledge.
[e]Relative risk ratio (relative risk of a participant choosing the category compared with the referent category).
[f]Models of the association between cognitive factors (ie, mindfulness, self-efficacy, nutrition knowledge) and frequency of eating out were adjusted for age, English-speaking ability, income, having an obesity-related disease (ie, overweight or obesity, diabetes, high blood pressure, cardiovascular disease), household size, and education level.
*$P < 0.05$.
**$P < 0.01$.

DISCUSSION

This is the first study known to the authors to investigate the association between cognitive factors (ie, mindfulness disposition, self-efficacy, and nutrition knowledge) and frequency of eating outside the home among Latinas. As hypothesized, lower dispositional mindfulness was associated with higher frequency of eating out when comparing individuals who ate out at least every week with those who ate out once a month or less or every 2 weeks. Lower self-efficacy was associated with eating out more often when comparing those who ate out once a month or less with those who ate out at least every week or every 2 weeks. Contrary to hypothesis 3, lower nutrition knowledge was associated with lower frequency of eating out for participants who ate out once a month or less compared with those who ate out at least every week.

Although no identified previous studies investigated the relationship between dispositional mindfulness and eating outside the home, extant evidence indicates that mindfulness disposition is associated with healthy eating (eg, less impulsive eating, reduced caloric consumption, and healthier snack choices)[38] and less binge and emotional eating.[39] Furthermore, empirical support is growing regarding mindfulness-based interventions as a promising behavioral treatment for obesity-related eating behaviors,[17,39] with long-lasting effects.[40] Timmerman and Brown[41] found that a mindful eating intervention (compared with a wait list control) among women who ate out an average of 5.6 times per week resulted in less weight gain, lower caloric intake, and lower fat intake. Promising trends also indicate that the intervention may have favorable effects on food consumption while eating out (ie, lower caloric and fat intake per restaurant visit and fewer barriers to managing intake when eating out). Finally, results are consistent with Ali and coworkers'[42] finding that weekly frequency of eating at all-you-can-eat buffets was associated with lower scores on the awareness subscale of dispositional mindfulness. This study provides preliminary findings that support the importance of further investigating the association between mindfulness and frequency of eating out in randomized intervention and longitudinal studies.

The association between lower self-efficacy of eating and purchasing healthy foods and higher frequency of eating out was in the expected direction. Past work has highlighted the important role of self-efficacy in healthy food consumption behaviors.[19,28] Findings from this study are consistent with past work that found facets of self-efficacy to be associated with eating outside the home.[18] A Canada-based study found low self-efficacy of meal management (ie, meal planning, choosing healthy foods in the grocery store, cooking for the family) was associated with higher fast-food consumption.[18] Future work that explores the role of self-efficacy in frequency of eating outside the home with longitudinal data should investigate which aspects of self-efficacy (eg, meal management vs eating and purchasing healthy foods) are most strongly associated with food consumption behavior.

Among the women in this sample, results show those with lower nutrition knowledge were more likely to eat out less than monthly compared with every week or more. Findings were significant in the opposite direction of that hypothesized. Despite nutritional programming implemented at Head Start programs, from which part of the sample was recruited, lower nutrition knowledge was significantly associated with lower frequency of eating out after controlling for individual variables. Possibly nutrition knowledge ineffectively affects healthy food consumption behavior in communities with powerful structural influences such as high density of fast food exposure.[43] Some literature has documented inconsistent findings when examining the association of nutrition knowledge with dietary intake[24] and body mass index (BMI).[25] For example, one study found higher nutrition knowledge to be associated with higher BMI.[25] Similarly, this study found lower nutrition knowledge to be associated with lower frequency of eating out. Future studies among similar populations also should examine diet quality

and quantity to better understand the effect of nutrition knowledge on food consumption behavior.

SCT's concept of reciprocal determinism—the interaction among personal factors, environmental factors, and behavior—has been underused in studies seeking to understand food consumption behavior. This study sought to understand cognitive factors associated with frequency of eating out by selecting individuals from similar geographic and food environments while controlling for personal characteristics. Possibly unmeasured environmental (eg, density of fast food options) or individual (eg, food preference) factors were more highly influential for women in this sample than cognitive variables measured in this study. Future studies exploring food consumption behaviors should consider the interaction between environmental and personal factors (eg, cognitive) that motivate behavior.

Strengths and Limitations

This study focused on Spanish- and English-fluent adult Latinas responsible for household food purchasing who were recruited via community organizations (ie, churches, Head Start programs), yielding participants with primarily low household incomes. Study strengths include pencil-and-paper surveys delivered orally by a bicultural and bilingual staff to increase understanding of survey questions. Food opportunities in communities represented in this study extend beyond fast-food options and include mobile food trucks and street vendors. The wording of the dependent variable question captured nontraditional food establishments (eg, food trucks, food stands).

The study has some limitations. The dependent variable, frequency of eating out, was self-reported and did not distinguish between fast-food or healthier options or quality of foods consumed. Possibly some participants who reported eating out more frequently chose healthier options at fast-food chains or dine-out restaurants. Although dining out is associated with bigger portion sizes,[6] a measure of diet quality while eating out would have provided a more objective indication of unhealthy food consumption behavior. Although past work conducted among ethnically diverse populations has noted that higher frequency of eating out may be a predictor of obesity,[3] height and weight data were not collected from study participants, so BMI could not be calculated; therefore, the association between eating out and obesity among study participants could not be examined. This sample had unique community characteristics and was nonrandom. Although many indigenous languages are spoken throughout Latin American countries, this paper focused on Latinas who are literate in Spanish or English. Other limitations include the lack of potential covariates (eg, marital status and employment). Food consumption behavior outside the home is influenced by several factors not measured in this study, including individual (eg, pressure or preferences from household family members to eat out vs home-cooked meals, workplace demands, time constraints) and structural community environments (eg, neighborhood density of fast-food restaurants, availability of grocery stores),[41,42,44,45] which also may affect food consumptions behaviors and goals. Participants were sampled from communities defined a priori as high-risk environments characterized by an overabundance of unhealthy food venues compared with healthy food venues. Findings are likely most generalizable to populations with similar demographic profiles in communities with similar structural influences, such as disproportionately high density of fast-food venues and low availability of healthy and affordable food options. Not all study measures were validated (ie, nutrition knowledge), and validated scales used (ie, Mindfulness Attention Awareness Scale and self-efficacy of eating and purchasing healthy foods) have yet to be validated among Spanish-speaking Latinas.

CONCLUSION

Findings from this study provide a starting point to exploring cognitive factors associated with eating out among Latinas. This study found associations between lower dispositional mindfulness and higher frequency of eating out when comparing individuals who ate out at least every week with those who ate out once a month or less or every 2 weeks. Lower self-efficacy was associated with eating out more when comparing those who ate out once a month or less with those who ate out at least every week or every 2 weeks. Lower nutrition knowledge was associated with lower frequency of eating out for participants who ate out once a month or less compared with those who ate out at least every week. Cognitive factors at the individual level of influence may be more modifiable than sociocultural and structural factors influencing food consumption behaviors. Before addressing cognitive factors associated with food consumption behaviors, future studies should confirm the direction of the association between cognitive factors and frequency of eating out among Latina women of similar socioeconomic status and seek to understand the influence of cognitive factors relative to sociocultural and structural factors among Latina women in similar environments.

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AUTHOR INFORMATION

S. Garcia is a PhD Student, Department of Population Health & Disease Prevention, Program in Public Health, University of California, Irvine. C. Valencia is a PhD Student, Department of Population Health & Disease Prevention, Program in Public Health, University of California, Irvine. H. Amaro is a Distinguished University Professor and Senior Scholar on Community Health, Herbert Wertheim College of Medicine and Robert Stempel College of Public Health & Social Work, Florida International University, Brewster, MA.

Address correspondence to: Samantha Garcia, MPH, Department of Population Health & Disease Prevention, Program in Public Health, University of California, Irvine, 653 E Peltason Drive, AIRB, Room 2020D, Irvine, CA 92697-3957; E-mail: samantg4@uci.edu

STATEMENT OF POTENTIAL CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

FUNDING/SUPPORT

This study was supported by the Community Benefits and Sponsorship Program, Keck Medical Center, University of Southern California (grant to H. A., principal investigator).

ACKNOWLEDGEMENTS

First, we thank the study participants and the funder, the Community Benefits and Sponsorship Program, Keck Medical Center, University of Southern California (grant to HA, principal investigator). We thank the following students from the University of Southern California who assisted in data collection: Maria Alejandra Heman, Edith Jaurequi, Beatriz Sosa-Prado, Lucette Sosa, and Ruth Vergara. The following community partners provided space for data collection: Fathers John Moretta and David Matz of the Los Angeles Catholic Archdiocese; Phillipa Johnson, executive director, USC School for Early Childhood Education; and Theda Douglas, vice president, USC Government Partnerships and Programs. We also thank the following individuals that provided statistical or theoretical guidance and input during early stages of the study: Dr Inna Arnaudova, Dr John Hipp, Dr Candice Odgers, Dr Annie Qu, Dr Annie Ro, Dr Mariana Sanchez and Ms Weize Wang. Eric Lindberg provided editorial services on an early draft of this manuscript. Permission was obtained from those named in the Acknowledgment.