

## Home Environment, Socio-cultural Characteristics, and Nutrition Knowledge of Users of a Soup Kitchen and Food Pantry

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### ABSTRACT

The present cross-sectional study examined the home environment, socio-cultural characteristics, and nutrition knowledge of 222 clients of a soup kitchen and food pantry. Participants completed a demographic questionnaire, Multidimensional Home Environment Scale, and Nutrition Knowledge Scale. The food pantry population consisted of more women, Blacks, Hispanics, and older clients than did those from the soup kitchen. Soup kitchen clients also exhibited lower socioeconomic status, and were mostly homeless, as compared to those of the food pantry. Both groups had a low level of nutrition knowledge (55%). Furthermore, most of the food pantry recipients were non-smokers and non-alcohol-drinkers, as compared to about half of the soup kitchen participants, who had lower availability of healthy foods at home and 50.9% of them consumed American foods. Thus, future research is essential to assess the impact of the home environment, socio-cultural influences, and nutrition knowledge on diet quality and food security of food recipients in the U.S.

**Keywords:** Food pantry, soup kitchen, home environment, socio-cultural characteristics, nutrition knowledge.

### INTRODUCTION

The availability of food at home has been negatively associated with a lack of employment and a shortage in socio-economic resources (Nackers and Appelhans, 2013), (Vijayaraghavan et al., 2011). This limited accessibility to food has the potential to affect the eating

behaviors of the low-income negatively (Leung et al., 2014). In the United States (U.S.) for instance, 14.6% of Americans live in low-income households (The U.S. Department of Health and Human Services, 2016) (DeNavas-Walt and Proctor, 2015). In response to the unavailability of food, individuals and agencies have developed programs to redistribute surplus foods to the low-income such as soup kitchens and food pantries

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(Office of the Chief Economist, 2014). Yet, these two facilities vary in terms of kind, amount, and frequency of the provided food (Mousa and Freeland-Graves, 2019) (Mousa and Freeland-Graves, 2018) (Mousa and Freeland-Graves, 2017), which could have different effects on dietary intake (Mousa and Freeland-Graves, 2019) (Mousa and Freeland-Graves, 2018). Moreover, clients who attend these locations may have distinctive personal and socioeconomic features that may alter their eating behavior. Therefore, the current research studied the home environment, socio-cultural characteristics, and nutrition knowledge of clients of a soup kitchen and food pantry.

Socio-ecological model of health and eating attitudes and behaviors is the basis of this study, which consists of four constructs (Figure 1): influences of social and cultural norms and values, sectors of influence, environmental settings, and individual variables (Fulkerson JA, 2008).

Socio-cultural norms in this investigation consisted of the acculturation degree, eating attitudes and beliefs, and nutrition knowledge. About acculturation, Martínez (2013) observed that in comparison with traditional mothers, the highly acculturated ones prepared high caloric homemade meals that included high-fat foods such as French fries and sweetened beverages.

In 2016, Tabbakh and Freeland-Graves (2016a) observed that the home environment mediated the effect of maternal nutrition knowledge on the diet quality of their teenage children. The 206 mothers who provided healthier foods and meals had higher diet quality in their children's diets. Thus, the home environment may be of critical importance in eating a healthy diet. Nonetheless, no investigation tested the home environment, socio-cultural characteristics, and nutrition knowledge of attendees of soup kitchens and food pantries, which this research has discussed.

Sectors of influence in the socio-ecological model include accommodation, income, and employment. A survey conducted in New Jersey showed that 19% of 62 food recipients lived in a temporary home and had a mean monthly income of \$ 578 (Kempson et al., 2003). In

Virginia, 75% and 15% of 1,500 food pantry and soup kitchen users were unemployed and homeless, respectively (Biggerstaff et al., 2002). These limited resources are believed to influence negatively the kind of food consumed. A cross-sectional study of 4,356 U.S. men and women observed that the low-income participants had a reduced ability to buy healthy foods such as fruits and vegetables, as compared to those with high incomes (24.8% vs. 75.2%,  $P < 0.05$ ) (Wang and Chen, 2012). It seems plausible that low socioeconomic status may adversely affect eating behaviors. However, previous reports did not assess the differences in accommodation, income, and employment of food recipients of both soup kitchens and food pantries.

In our study, we chose the environmental variables of home and community surroundings. These could influence the availability and accessibility of food (Fulkerson et al., 2008). When healthy foods are prevalent in the home environment, a positive effect on eating behaviors has been noted (Tabbakh and Freeland-Graves, 2016a). Furthermore, previous studies have found that low-income individuals purchase "convenience foods" rather than "fresh produce" because the former is cheaper. Additionally, the low-income often reside in unsafe neighborhoods or "food deserts" that lack transit modes and grocery stores (Shanks et al., 2015), (Walker et al., 2012). Thus, the present research explored the home environment and community surroundings of clients of a soup kitchen and food pantry.

Lastly, individual factors in the socio-ecological model were measured for both groups of food donation programs. These include demographics including age, gender, and ethnicity (Ogden et al., 2015), (Ogden et al., 2014); health such as hypertension (Kurukulasuriya et al., 2011), dyslipidemia (Franssen et al., 2011), and diabetes (Nguyen et al., 2011); and psychosocial variables (Cahill et al., 2009). The psychological factors in this model consist of lack of social support (Clarke et al., 2007), eating attitudes and beliefs, self-efficacy, emotional eating, and dietary restraint (Cahill et al., 2009), (Tabbakh and Freeland-Graves, 2016b). All of these aspects are associated with negative dietary behaviors such as low

intake of fruits and vegetables (Cahill et al., 2009) (Tabbakh and Freeland-Graves, 2016b). Yet, the literature lacks information about the variation between users of soup kitchens and food pantries regarding individual psychological variables. This study, therefore,

aimed to examine the home environment, socio-cultural characteristics, and nutrition knowledge of clients of a soup kitchen and food pantry.

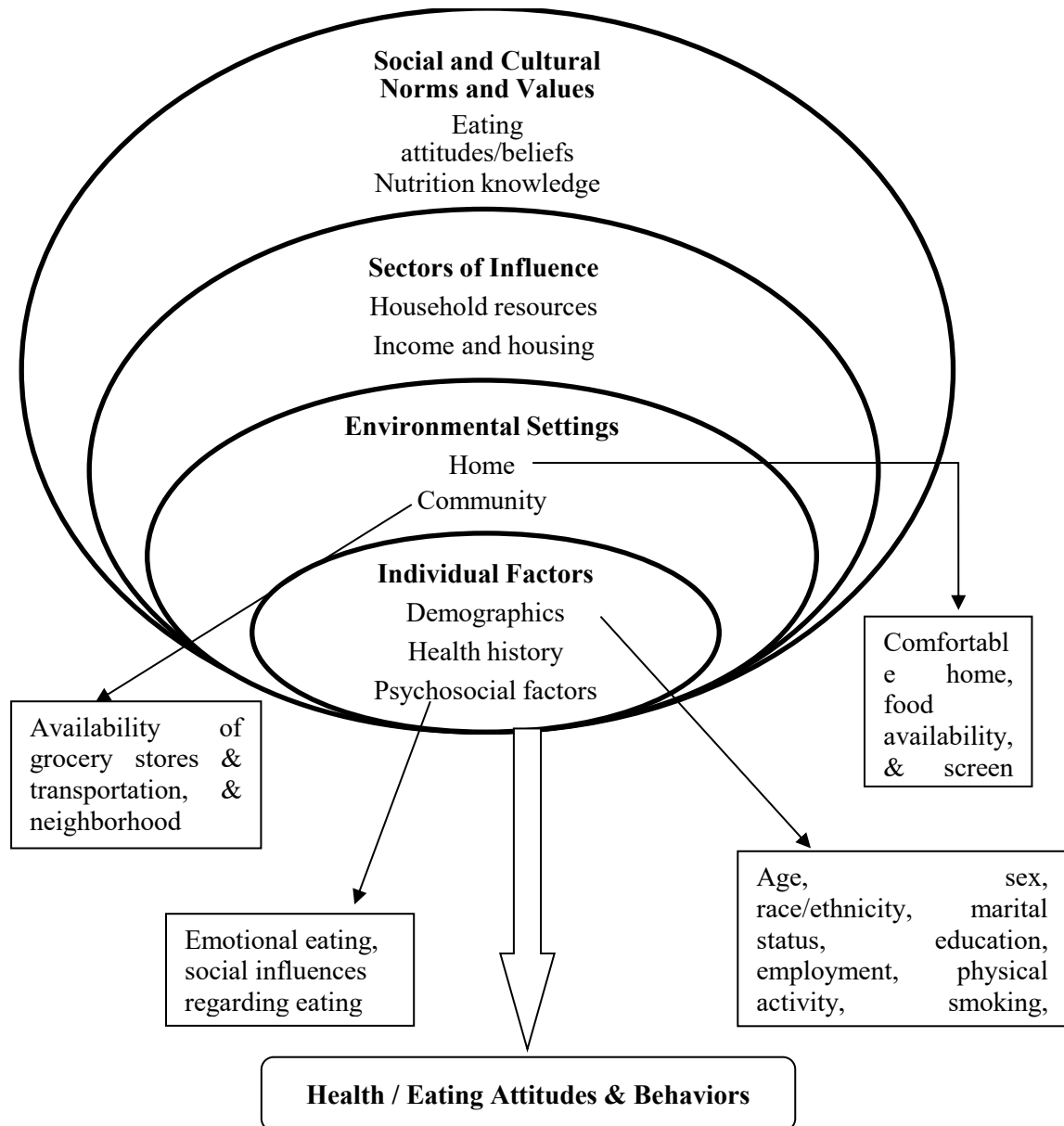


Figure 1. Social-Ecological Model of health and eating attitudes and behaviors of low-income clients receiving food assistance.

## Materials and Methods

### Design

We designed a cross-sectional study to recruit 222 adults ( $\geq 18$  years) who received free food benefits from food banks/pantries and soup kitchens in Central Texas. Fourteen locations of food distribution were contacted by email, phone, and personal communication. Subsequently, the researcher and four trained undergraduate nutrition students visited each setting four times. Participants completed a demographic questionnaire (Klohe-Lehman *et al.*, 2006), the Multidimensional Home Environment Scale (MHES) (Tabbakh and Freeland-Graves, 2016b), and a Nutrition Knowledge Scale (Tabbakh and Freeland-Graves, 2016a). The Institutional Review Board at the University of Texas at Austin has approved this project.

### Participants

A total of 222 clients ( $\geq 18$  years) who received free food and meals were randomly recruited. A written consent form was obtained from the participants, followed by explaining the nature of the research, and administration of the instruments. Participants received a compensation of \$10, upon successful completion of the survey. All adult participants were included in this research, except those who received food donations from more than one agency.

### Tools of Assessment

**The demographic Questionnaire** includes 25 questions regarding age, sex, ethnicity, weight, height, educational level, marital status, occupation, housing resources, and socioeconomic status of the clients. This instrument was developed and validated by the author in a sample of 141 low-income women receiving food assistance (Klohe-Lehman *et al.*, 2006).

**Multidimensional Home Environment Scale** is a 38-item scale developed and validated by our laboratory (Tabbakh and Freeland-Graves, 2016b). This index measures the socio-cultural variables, home environment,

and eating attitudes and beliefs. Items on this questionnaire are based on the constructs of the socio-ecological model (Fulkerson *et al.*, 2008). The MHES assessed eating attitudes and beliefs (social and cultural norms and values); household resources and housing (sectors of influence); home food availability and accessibility, and neighborhood safety (environmental factors); and self-efficacy, emotional eating, social eating, and support, time and convenience (individual variables). Questions were scored in a likert format, with response options ranging from 1-5 (“Strongly Disagree” to “Strongly Agree” or “Never” to “Always”). Cronbach’s  $\alpha$  for the total scale was 0.82 (Tabbakh and Freeland-Graves, 2016b).

**Nutrition Knowledge Scale** is a 20-item questionnaire developed and validated by our laboratory to assess nutrition knowledge (Tabbakh and Freeland-Graves, 2016a). The score ranges from 0 to 20, with a higher score reflecting a better understanding of regarding healthy dietary intake (Cronbach’s  $\alpha = 0.7$ ). This scale includes multiple-choice and true/false items that measured nutritional awareness and information regarding weight loss, fast foods, MyPlate, and macro- and micro-nutrients (Tabbakh and Freeland-Graves, 2016a) (Klohe-Lehman *et al.*, 2006).

### Statistical Analysis

Statistical analysis was conducted using the Graduate Pack SPSS 19.0 for windows 2010 Descriptive statistics were performed and presented as means, standard error of the mean (SEM), and frequency distributions. Differences between the clients of the soup kitchen and food pantry were compared for demographics, the home environment, socio-cultural characteristics, eating attitudes and beliefs, and nutrition knowledge. These were measured via analysis of covariance (ANCOVA) for continuous variables (home environment, eating attitudes and beliefs, and nutrition knowledge), and chi-square tests for categorical data (age, sex, ethnicity, body mass index (BMI), annual income, education, employment, housing,

smoking, drinking, physical activity, health status, shopping practices, and socio-cultural characteristics). Bonferoni post hoc tests and Kruskal-Wallis H-tests were used to compare two or more independent samples of equal or different sample sizes. All two-tailed  $P < 0.05$  were considered significant.

## Results

Table 1 illustrates the demographic characteristics of the clients of a soup kitchen and food pantry. The food pantry had older clients, and served more women than men, as compared to those of the soup kitchen ( $P < 0.001$ ). The soup kitchen had a greater number of Caucasians than the food pantry, which had clients who were primarily African Americans and Hispanics ( $P < 0.001$ ). Participants in the food pantry had a greater BMI (29 vs. 26 kg/m<sup>2</sup>) and more than two-thirds were overweight or obese, as compared to less than half of those in the soup kitchen ( $P = 0.001$ ). More than one-third of the food pantry participants were married, as compared to only one-tenth in the soup kitchen ( $P < 0.001$ ). Less than one-third of both samples were employed. The food pantry adults had a higher annual income than did those in the soup kitchen. Approximately 5% and 86% of a soup kitchen and food pantry clients, respectively, reported that they had a dwelling in which to live ( $P < 0.01$ ) (Table 1).

Compared with the food pantry, a larger number of the soup kitchen sample lived below the poverty line (67.9% vs. 92.7%,  $P = 0.000$ ). In addition, a greater proportion of soup kitchen clients had training (i.e.; carpentry), or a college, university, or graduate degree ( $P < 0.001$ ). It should also be noted that both groups engaged in food shopping practices such as the use of grocery specials (43.7%), shopping lists (22.2%), and coupons (14%).

Socio-cultural characteristics of a soup kitchen and food pantry recipients are shown in Table (2). Most recipients of the food pantry were non-smokers and did not drink, as compared to about half of the soup kitchen participants, who smoked cigarettes and/or drank alcohol ( $P < 0.01$ ). The majority of the two groups were physically active but had health conditions such as hyperlipidemia and hypertriglyceridemia, hypertension, type-2 diabetes, arthritis, or depression. About 36% of the food pantry sample spoke Spanish, 33% and 28% consumed American or Latino food at home, respectively, and 60% contacted their family in the country of origin every week. In contrast, the majority of soup kitchen recipients spoke English (95.4%), half of them ate primarily American foods (50.9%), and more than one-third communicated with their family at least once a week (37.3%) ( $P < 0.05$ ).

**Table 1. Demographic characteristics of clients of a soup kitchen and food pantry (n=222).**

| Characteristic                     | Food Pantry (n=112)    | Soup Kitchen (n=110)   | X <sup>2</sup> | P *   |
|------------------------------------|------------------------|------------------------|----------------|-------|
|                                    | n (%)                  |                        |                |       |
| Age, yrs                           |                        |                        | 11.07          | 0.004 |
| 20 - 40                            | 23 (20.5) <sup>a</sup> | 37 (33.6) <sup>a</sup> |                |       |
| 41 - 60                            | 62 (55.4) <sup>a</sup> | 63 (57.3) <sup>a</sup> |                |       |
| 61 - 81                            | 27 (24.1) <sup>b</sup> | 10 (9.1) <sup>b</sup>  |                |       |
| Sex                                |                        |                        | 23.57          | 0.000 |
| Male                               | 42 (37.5) <sup>a</sup> | 77 (70) <sup>a</sup>   |                |       |
| Female                             | 70 (62.5) <sup>b</sup> | 33 (30) <sup>b</sup>   |                |       |
| Ethnicity                          |                        |                        | 24.89          | 0.000 |
| Non-Hispanic White                 | 26 (23.2) <sup>a</sup> | 56 (50.9) <sup>a</sup> |                |       |
| Hispanic                           | 45 (40.2) <sup>c</sup> | 16 (14.5) <sup>c</sup> |                |       |
| African-American                   | 34 (30.4) <sup>b</sup> | 31 (28.2) <sup>b</sup> |                |       |
| Other                              | 7 (6.3) <sup>a,b</sup> | 7 (6.4) <sup>a,b</sup> |                |       |
| Body mass index, kg/m <sup>2</sup> |                        |                        | 16.61          | 0.001 |

|  |                         |                          |        |       |
|--|-------------------------|--------------------------|--------|-------|
| Underweight                            | 7 (6.3) <sup>a,b</sup>  | 7 (6.4) <sup>a,b</sup>   |        |       |
| Healthy weight                         | 28 (25) <sup>a</sup>    | 53 (48.2) <sup>a</sup>   |        |       |
| Overweight                             | 35 (31.3) <sup>b</sup>  | 31 (28.2) <sup>b</sup>   |        |       |
| Obese                                  | 42 (37.5) <sup>b</sup>  | 19 (17.3) <sup>b</sup>   |        |       |
| Marital status                         |                         |                          | 25.0   | 0.000 |
| Married                                | 42 (37.5) <sup>a</sup>  | 11 (10) <sup>a</sup>     |        |       |
| Single/widowed                         | 60 (53.6) <sup>b</sup>  | 79 (71.8) <sup>b</sup>   |        |       |
| Divorced                               | 10 (8.9) <sup>a,b</sup> | 20 (18.2) <sup>a,b</sup> |        |       |
| Employment status (full and part-time) |                         |                          | 0.087  | 0.768 |
| Yes                                    | 20 (17.9) <sup>a</sup>  | 18 (16.4) <sup>a</sup>   |        |       |
| No                                     | 92 (83.6) <sup>a</sup>  | 92 (83.6) <sup>a</sup>   |        |       |
| Annual Income, \$                      |                         |                          | 31.56  | 0.000 |
| < 1,000                                | 44 (39.3) <sup>a</sup>  | 83 (75.5) <sup>a</sup>   |        |       |
| 1,000 - 10,000                         | 31 (27.7) <sup>b</sup>  | 17 (15.5) <sup>b</sup>   |        |       |
| > 10,000                               | 37 (33) <sup>a</sup>    | 10 (9.1) <sup>b</sup>    |        |       |
| Housing type                           |                         |                          | 156.76 | 0.000 |
| Own                                    | 28 (25) <sup>a</sup>    | 2 (1.8) <sup>a</sup>     |        |       |
| Rent/public                            | 68 (60.7) <sup>b</sup>  | 3 (2.7) <sup>a</sup>     |        |       |
| Homeless, live:                        |                         |                          |        |       |
| In car/van/trailer/ shelter            | 11 (9.8) <sup>c</sup>   | 58 (52.7) <sup>b</sup>   |        |       |
| On streets                             | 5 (4.5) <sup>c</sup>    | 47 (42.7) <sup>b</sup>   |        |       |
| Education                              |                         |                          | 14.32  | 0.006 |
| Junior high                            | 21 (18.8) <sup>a</sup>  | 7 (6.4) <sup>a</sup>     |        |       |
| High school                            | 59 (52.7) <sup>b</sup>  | 48 (43.6) <sup>b</sup>   |        |       |
| Partial college/training               | 15 (13.4) <sup>c</sup>  | 24 (21.8) <sup>c</sup>   |        |       |
| College/university, graduate           | 17 (15.2) <sup>c</sup>  | 31 (28.2) <sup>c</sup>   |        |       |

\* A  $P \leq 0.05$  (using chi-square test) indicates significant differences between food pantry and soup kitchen clients.

<sup>a,b</sup> Different superscripts in columns indicate significant differences at  $P \leq 0.05$ ; using Kruskal-Wallis H-test.

**Table 2. Socio-cultural characteristics of a soup kitchen and food pantry recipients (n=222).**

| Characteristic                  | Food Pantry (n=112)     | Soup Kitchen (n=110)    | X <sup>2</sup> | P *   |
|---------------------------------|-------------------------|-------------------------|----------------|-------|
|                                 | n (%)                   |                         |                |       |
| Current smoking status          |                         |                         | 58.65          | 0.000 |
| Non-smoker                      | 88 (78.6) <sup>a</sup>  | 30 (27.3) <sup>a</sup>  |                |       |
| Cigarettes/cigar/hookah         | 24 (21.4) <sup>b</sup>  | 80 (72.7) <sup>b</sup>  |                |       |
| Current alcohol use             |                         |                         | 18.45          | 0.000 |
| Non-drinker                     | 92 (82.1) <sup>a</sup>  | 61 (55.5) <sup>a</sup>  |                |       |
| Beer/wine/whisky                | 8 (17.9) <sup>b</sup>   | 39 (44.5) <sup>b</sup>  |                |       |
| Self-reported physical activity |                         |                         | 0.856          | 0.409 |
| Yes                             | 86 (76.8) <sup>a</sup>  | 90 (81.8) <sup>a</sup>  |                |       |
| No                              | 26 (23.2) <sup>b</sup>  | 20 (18.2) <sup>b</sup>  |                |       |
| Self-reported health status     |                         |                         | 2.41           | 0.131 |
| Healthy                         | 35 (31.3) <sup>a</sup>  | 24 (21.8) <sup>a</sup>  |                |       |
| Health condition                | 77 (68.75) <sup>b</sup> | 86 (78.2) <sup>b</sup>  |                |       |
| Language spoken at home         |                         |                         | 52.43          | 0.000 |
| English                         | 65 (58.04) <sup>a</sup> | 105 (95.5) <sup>a</sup> |                |       |

|  |                         |                        |       |       |
|--|-------------------------|------------------------|-------|-------|
| Spanish  | 40 (35.7) <sup>b</sup>  | 0 (0)                  |       |       |
| Both   | 5 (4.5) <sup>c</sup>    | 5 (4.5) <sup>b</sup>   |       |       |
| Other (Asian, Arabic)  | 2 (1.8) <sup>c</sup>    | 0 (0)                  |       |       |
| Cuisine type typically eaten at home                           |                         |                        | 28.08 | 0.000 |
| American   | 37 (33.01) <sup>a</sup> | 56 (50.9) <sup>a</sup> |       |       |
| Latino   | 31 (27.7) <sup>a</sup>  | 5 (4.54) <sup>b</sup>  |       |       |
| Both Equally   | 36 (32.1) <sup>a</sup>  | 30 (27.3) <sup>c</sup> |       |       |
| Other (Kosher, Halal)  | 8 (7.1) <sup>b</sup>    | 19 (17.3) <sup>d</sup> |       |       |
| Frequency of communication with family in the country of birth |                         |                        | 12.23 | 0.016 |
| Daily  | 28 (25) <sup>a</sup>    | 17 (15.5) <sup>a</sup> |       |       |
| Weekly   | 39 (34.8) <sup>b</sup>  | 24 (21.8) <sup>b</sup> |       |       |
| Monthly  | 12 (10.7) <sup>c</sup>  | 13 (11.8) <sup>c</sup> |       |       |
| Yearly   | 14 (12.5) <sup>c</sup>  | 24 (21.8) <sup>b</sup> |       |       |
| Never  | 19 (17) <sup>d</sup>    | 32 (29.1) <sup>d</sup> |       |       |

\* A  $P \leq 0.05$  (using chi square test) indicates significant differences between food pantry and soup kitchen clients.

<sup>a,b</sup> Different superscripts in columns indicate significant differences at  $P \leq 0.05$ ; using Kruskal-Wallis H-test.

Aspects of the home environment of a soup kitchen and food pantry clients are presented in **Table 3**. Food pantry clients had greater availability of healthy foods at home and a more comfortable home arrangement (dining, storage, and cooking facilities). They also reported spending more time watching a screen (television (TV), computer, video games, or smart phone) ( $P < 0.02$ ). Mean scores of physical and social characteristics of the neighborhood and its safety, as well as the availability of transportation, were significantly higher among food pantry than soup kitchen participants ( $P \leq 0.02$ ). Clients

of the soup kitchen also reported fewer social influences regarding eating attitudes and behaviors (eating convenience foods due to pressure from family and friends) than those of the food pantry ( $P < 0.01$ ). Both samples, however, had similar but low nutrition knowledge, cultural attachment regarding eating, social and emotional eating, healthy eating attitudes, and self-efficacy scores, with a mean score of  $\sim 55\%$  ( $P > 0.1$ ).

**Table 3. The home environment of clients of a soup kitchen and food pantry according to the Multi-Dimensional Home Environment Scale \* (n=222).**

| Home Environment                          | Food Pantry (n=112)       |        | Soup Kitchen (n=110)      |        | P     |
|---|---------------------------|--------|---------------------------|--------|-------|
|   | Mean ± SEM                | Range  | Mean ± SEM                | Range  |       |
| Food available at home                    |                           |        |                           |        |       |
| Healthy *                                 | 7.42 ± 0.19 <sup>a</sup>  | 2 - 10 | 6.70 ± 0.22 <sup>b</sup>  | 2 - 10 | 0.015 |
| Unhealthy *                               | 9.95 ± 0.47 <sup>a</sup>  | 3 - 50 | 10.35 ± 0.29 <sup>a</sup> | 3 - 15 | 0.463 |
| Comfortable home *                        | 7.04 ± 0.22 <sup>a</sup>  | 2 - 10 | 5.13 ± 0.22 <sup>b</sup>  | 2 - 10 | 0.000 |
| Screen viewing *§                         | 10.53 ± 0.42 <sup>a</sup> | 0 - 20 | 8.25 ± 0.46 <sup>b</sup>  | 0 - 20 | 0.000 |
| Neighborhood characteristics *            |                           |        |                           |        |       |
| Physical, availability of parks           | 7.01 ± 0.24 <sup>a</sup>  | 2 - 20 | 6.21 ± 0.19 <sup>b</sup>  | 2 - 10 | 0.010 |
| Social, friends live in same neighborhood | 12.36 ± 0.38 <sup>a</sup> | 4 - 20 | 11.20 ± 0.32 <sup>b</sup> | 4 - 17 | 0.020 |
| Safety, security/crime rate               | 6.92 ± 0.22 <sup>a</sup>  | 2 - 10 | 5.61 ± 0.22 <sup>b</sup>  | 2 - 10 | 0.000 |
| Availability of                           |                           |        |                           |        |       |

|   |                           |         |                           |         |       |
|---|---------------------------|---------|---------------------------|---------|-------|
| Transportation *  | 6.52 ± 0.18 <sup>a</sup>  | 2 - 10  | 5.96 ± 0.16 <sup>b</sup>  | 2 - 10  | 0.020 |
| Grocery stores *  | 6.35 ± 0.19 <sup>a</sup>  | 2 - 10  | 6.73 ± 0.20 <sup>a</sup>  | 2 - 10  | 0.169 |
| Social influences on negative eating behaviors <sup>*f</sup>              | 28.19 ± 0.73 <sup>a</sup> | 15 - 50 | 24.97 ± 0.77 <sup>b</sup> | 10 - 50 | 0.003 |
| Social support from family/friends regarding healthy eating <sup>*λ</sup> | 14.04 ± 0.45 <sup>a</sup> | 4 - 20  | 13.36 ± 0.45 <sup>a</sup> | 4 - 25  | 0.285 |
| Nutrition Knowledge Scale <sup>¶</sup>                                    | 11.38 ± 0.31 <sup>a</sup> | 4 - 19  | 11.2 ± 0.37 <sup>a</sup>  | 0 - 18  | 0.704 |
| Cultural attachment regarding eating *                                    | 13.63 ± 0.39 <sup>a</sup> | 4 - 20  | 13.5 ± 0.36 <sup>a</sup>  | 4 - 25  | 0.814 |
| Social eating <sup>*‡</sup>   | 3.46 ± 0.19 <sup>a</sup>  | 0 - 10  | 3.76 ± 0.23 <sup>a</sup>  | 0 - 10  | 0.325 |
| Emotional eating *  | 10.7 ± 0.37 <sup>a</sup>  | 4 - 20  | 11.48 ± 0.38 <sup>a</sup> | 4 - 20  | 0.140 |
| Healthy eating attitudes *  | 7.20 ± 0.24 <sup>a</sup>  | 2 - 18  | 7.59 ± 0.17 <sup>a</sup>  | 2 - 10  | 0.184 |
| Self-efficacy *   | 10.15 ± 0.32 <sup>a</sup> | 3 - 15  | 10.53 ± 0.27 <sup>a</sup> | 3 - 15  | 0.369 |

<sup>a,b</sup> Different superscripts between columns indicate significant differences at  $P \leq 0.05$ .

\* A  $P$ -value  $\leq 0.05$  (using ANCOVA) indicates significant differences between food pantry and soup kitchen clients.

\*\* Multi-Dimensional Home Environment Scales have positive relationships with the total score.

<sup>¶</sup> Scale ranges from 0 to 20; a higher score reflects higher nutrition knowledge.

<sup>f</sup> Social influences include eating fast/convenient foods due to family/friends pressure that it is good to eat such foods.

<sup>λ</sup> Social support describes the support one receives when deciding to eat healthy foods such as whole grains and vegetables, and not to eat candy, fast, or processed foods.

<sup>‡</sup> Social eating includes engaging in eating foods offered at social events or gatherings such as birthday parties, weddings, or Thanksgiving/Christmas dinner.

<sup>§</sup> Screen viewing is defined as the total time spent in front of any type of screen (TV, computer, laptop, tablet, smartphone, or video games).

## Discussion

These data show that food pantry clients had distinct characteristics when compared with those of the soup kitchen, particularly regarding demographics, socio-cultural, and the home environment. Sexual dimorphism was observed, with more women utilizing food pantries, while more men visited soup kitchens. In line with this, [a study by Will and Milligan \(2015\)](#) reported that 66% of 491 low-income and homeless clients ( $\bar{x}$  age = 52 years) of Second Harvest in North Florida were women and Caucasians. Similar research in Virginia (Biggerstaff *et al.*, 2002), observed that the majority (69%) of 1,500 food pantry and soup kitchen clients (mean age 42.3 years) were women. Moreover, 47% and 46% of the participants were African Americans and Caucasians, respectively (Biggerstaff *et al.*, 2002). Other studies were conducted in the states of Washington (Hoisington *et al.*, 2002), North Carolina (Ahluwalia *et al.*, 1998), and New York (Bowering *et al.*, 1991; Clancy *et al.*, 1991), as well as Canada (Starkey *et al.*, 1998), showed results that are comparable to our findings regarding the characteristics

of food recipients. Yet, the gender variation between the two facilities is unclear and requires examination in the future.

Clients of the soup kitchen were more fragile socio-economically and encountered more critical challenges than those of the food pantry in terms of income, employment, and homelessness. Most of the soup kitchen participants lacked financial resources, lived under the poverty threshold [\$ 11,880 per person (The U.S. Department of Health and Human Services, 2016)], and were primarily unemployed and homeless. Yet in 2015, Will *et al.* observed that although 39% of 491 users of the Second Harvest owned a home, only 14% had a part- or full-time job, and most of them had an income of less than \$20,000 (Will and Milligan, 2015). Studies from 1991 examined 263 soup kitchens (Bowering *et al.*, 1991) and 519 food pantry (Clancy *et al.*, 1991) clients in New York. The majority of both populations had an income below 100% of the poverty threshold. Outcomes of other investigations (Kempson *et al.*, 2003; Hoisington *et al.*, 2002; Starkey *et al.*, 1998) support our results that users

of food emergency programs exhibit a great need for the food donations provided by charitable agencies, which may vary by geographical area. The offered food may be vital for the survival of some families who have no source of income. Thus, we believe that this necessity for food could prevent malnourishment or alleviate hunger among food recipients.

Although both groups had finished high school, clients of the soup kitchen had a higher educational level. This might be because a small percentage (7.2%) of the participants were students. In North Carolina, Ahluwalia *et al.* found that 51% of 141 men and women receiving food benefits had finished high school (Ahluwalia *et al.*, 1998). Nonetheless, in Virginia, only 3.2% of 1,500 users of food pantries and soup kitchens had completed an education that was greater than high school (Biggerstaff *et al.*, 2002). These findings agree with ours that the majority of food assistance recipients had finished high school (Yu *et al.*, 2010; Kaiser, 2008; (Nnakwe, 2008; Richards and Smith, 2006).

The prevalence of obesity in our food pantry clients (37.5%) was similar to the national rate (39.8%) (Hales *et al.*, 2017), and to that in the low-income (35.5%) (Ogden *et al.*, 2010). However, obesity was apparent only in 17.3% of those from the soup kitchen, and about half of the sample had healthy weights. In contrast, Martins *et al.* found that 39% of 313 homeless food recipients had a BMI > 30 kg/m<sup>2</sup> (Martins *et al.*, 2015). Another study observed that both attendants of shelters and food centers had similar weight statuses. Authors reported that 55.9% and 61.1% of 36 and 56 American women who receive food rations from shelters and food pantries, respectively, were obese (Dammann and Smith, 2009). Moreover, a cross-sectional study that examined the social and demographic characteristics of 490 food bank users in Montreal did not agree with our results. For instance, Starkey *et al.* indicated that only 17.1% and 27.3% of the respondents were overweight and obese, respectively (Starkey *et al.*, 1998). The discrepancy in the prevalence of overweight and obesity is probably due to the differences in the kind and quantity of food donations provided to food bank attendees (Mousa and Freeland-

Graves, 2019; Mousa and Freeland-Graves, 2018); yet this finding is worth further exploration.

In addition, this study found that a larger proportion of soup kitchen participants smoked, drank alcohol, and had a health problem than those utilizing a food pantry. In 2013, Okuyemi *et al.* (2013) showed that 6.4% and 2.3% of 430 homeless smokers in Minnesota ( $\bar{x}$  age = 44.4 years) suffered from depression and stress, respectively, and 40.7% drank seven or more alcoholic drinks within 2 weeks. Other studies also showed that 80.5% of homeless food recipients with a mental disorder (Mojtabai, 2005), and 87% of soup kitchen clients (Rosenblum *et al.*, 2005) engaged in alcohol and/or drug abuse. Similarly, less than half of 490 food bank users in Montreal were smokers (Starkey *et al.*, 1998). These findings support our outcomes that smoking, drinking alcohol, and/or having a health problem are prevalent characteristics among the low-income using food assistance agencies. We suggest that these behaviors possibly will contribute to poor dietary intake, probably due to that clients could use their resources to buy cigarettes or alcohol at the expense of purchasing food. Nevertheless, this implication must be tested in the future.

Furthermore, compared with the soup kitchen clients, a larger proportion of those in the food pantry consumed a Latino diet. Changes in eating behaviors due to acculturation might arise from the language barrier, inaccessibility to healthy foods, lack of resources, and abundance of convenience and fast foods in the new country (Satia, 2010; Ayala *et al.*, 2008). In line with this, Martinez and colleagues (Martínez, 2013) reported that acculturated Hispanic Americans frequently engaged in consuming meals at restaurants, and cooking processed and convenience foods at home. Yet, in the country of origin, mothers used to prepare healthy homemade meals that were based on an abundance of whole grains, vegetables, and fruits (Martínez, 2013). Accordingly, acculturation might be a reason for low-income individuals to engage in contemporary (unhealthy) American eating behaviors.

In the present study, the availability of healthy food at the residence, living in a comfortable home, social

influences on eating behavior, and watching a screen were more prevalent in food pantry clients. The soup kitchen clients, however, were mostly homeless and probably had very few friends or family who could affect their diet. Furthermore, not having a permanent residence may explain the inaccessibility to food and a screen. A recent study signified that living in a comfortable home had a positive effect on eating attitudes and weight gain prevention, perhaps due to a more social environment and availability of healthy food at home (Tabbakh and Freeland-Graves, 2016c). Yet, Tabbakh and Graves (2016c) assumptions were tested in 103 adolescents and their mothers. Additional research, therefore, is warranted to assess the relationship between residence quality and both diet quality and food security of the low-income receiving food donations.

To the authors' knowledge, this is the first study to assess screen viewing in food recipients, which may negatively influence their dietary behaviors. Thus, researchers should measure the frequency and duration of screen viewing and their impact on eating behaviors, as well as nutrition and weight statuses in clients of soup kitchens and food pantries.

Our study also showed that food pantry users lived in a relatively safe neighborhood, which had an area to walk or exercise, and public transportation as compared to soup kitchen participants. Availability of transportation may reduce the probability of physical activity (Sallis and Glanz, 2009). Moreover, it is believed that living in a safe neighborhood with food outlets (~ 60% of our sample) may increase the consumption of fast and processed foods (Smith and Miller, 2011). In 2016, Mackenbach et al. found that lack of a sufficient number of supermarkets decreased consumption of vegetables by 0.6-fold and increased sweets intake by 1.4-fold ( $P < 0.05$ ) (Mackenbach *et al.*, 2016). Whether there is a relationship between the eating behaviors of users of food assistance agencies and living in safe neighborhoods that also have transportation systems and food outlets is not clear, therefore future investigations should discuss the validity of such a proposition.

Finally, we observed low levels of nutrition knowledge among both food pantry and soup kitchen attendants. A recent survey that discerned the challenges that influence the eating attitudes of 54 food pantry clients supports our results. For instance, most of the participants aged 18 - 30 years ( $n = 12$ ) did not have enough information about nutrition and food preparation (Dave *et al.*, 2017). In 2016, another study explored the perceptions that 1,656 soup kitchen Brazilian users had regarding healthy eating and its barriers (Bento *et al.*, 2016). The authors indicated that respondents were aware of healthy nutrition behaviors, yet they did not practice them. Therefore, nutrition interventions should encourage converting knowledge into action (Bento *et al.*, 2016). Previously, Acheampong and Haldeman (2013) also reported that low-income African American mothers (receiving food assistance) exhibited better nutrition knowledge than Hispanics. To sum up, a lack of nutrition awareness and not implementing it may adversely affect food purchasing, cooking, and eating. Thus, interventional studies are required to promote the engagement of clients of soup kitchens and food pantries in healthy eating behaviors.

Strengths of the present research are the utilization of validated scales and random recruitment of the participants. Limitations include insufficient funds that restricted the size of the sample, and only self-reported weights and heights were recorded due to limited resources.

## Conclusions

To the best of our knowledge, this is the first study to examine the home environment, socio-cultural characteristics, and nutrition knowledge of clients of a soup kitchen and food pantry in Austin, Texas. This research documented that soup kitchen attendants had lower socioeconomic status, were mostly homeless and were less likely to have access to healthy foods than food pantry recipients. Moreover, smoking, drinking alcoholic beverages, residing in an unsafe neighborhood, unavailability of transportation, and consuming an American diet were more prevalent among the attendees

of the soup kitchen. These distinctive features could have a negative on the ability to purchase healthy foods such as fruits and vegetables; since the high prices of healthy foods may be unaffordable for clients of food assistance organizations in general, and soup kitchens in particular. Limited accessibility also may have adverse effects consequences on the nutrition and food security statuses of our sample. Thus, future research is essential to assess the impact of the home environment, socio-cultural influences, and nutrition knowledge on diet quality and food security of the low-income receiving food donations in the U.S.

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## البيئة المنزلية، والخصائص الاجتماعية والثقافية، والمعرفة التغذوية لمستخدمي مطبخ الحساء ومخزن الطعام

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### ملخص

فحصت هذه الدراسة المقطعية البيئة المنزلية، والخصائص الاجتماعية والثقافية، والمعرفة التغذوية لـ 222 شخصاً يحصلون على معونات غذائية من مؤسستي مطبخ الحساء (وجبة الفقراء) ومخزن الطعام/المؤن. قام المشاركون بتعبئة استبياناً ديموغرافياً، ومقياس بيئة المنزل متعدد الأبعاد، ومقياس المعرفة التغذوية. تألفت عينة مخزن الطعام من عدد أكبر من النساء، والسود، واللاتينيين، والأشخاص الأكبر سناً مقارنة بأولئك الذين يأخذون المعونات الغذائية من مطبخ الحساء. كذلك كان الأشخاص الذين يحصلون على المعونات من مطبخ الحساء ذوو وضعاً اجتماعياً واقتصادياً منخفضاً، وكانوا في الغالب بلا مأوى، مقارنةً بهؤلاء الذين يلجأون إلى مخزن الطعام لأخذ حاجتهم من الغذاء. وكان لدى كلتا المجموعتين مستوى منخفض من المعرفة التغذوية (55%). علاوة على ذلك، فإن معظم متلقي الطعام كانوا غير مدخنين ولا يشربون الكحول، مقارنة بحوالي نصف المشاركين في مطبخ الحساء الذين كان لديهم كمية قليلة من الأطعمة الصحية في المنزل، وكذلك 50.9 % منهم يستهلكون الأطعمة الأمريكية (نظام غذائي غير صحي). وبالتالي، فإن القيام ببحث مستقبلي ضروري لتقييم تأثير البيئة المنزلية والتأثيرات الاجتماعية والثقافية والمعرفة التغذوية على جودة النظام الغذائي والأمن الغذائي لمتلقي المعونات الغذائية في الولايات المتحدة.

**الكلمات الدالة:** مخزن الطعام، وجبة للفقراء، بيئة المنزل، الخصائص الاجتماعية والثقافية، المعرفة التغذوية.