Food Security and Homelessness in the City of Anaheim

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Abstract

The primary purpose of the City of Anaheim's 2007 Homeless Survey was to provide city staff with an opportunity to understand the characteristics of the City's homeless population. The purpose of this study was to determine whether food insecurity was associated with: (1) homelessness, (2) demographic characteristics such as age, gender, and ethnicity, (3) mental and physical illness, and (4) family life among 85 homeless individuals in Anaheim. Although duration of homelessness was not associated with food insecurity, we found that older participants, White participants, and those with more symptoms of schizophrenia were more likely to experience food insecurity. The results suggest that a substantial proportion of homeless individuals experience food insecurity, and that many of them do not utilize food resources.

Although the present study was limited in range, the results demonstrate the existence of food insecurity among the homeless of Anaheim. This problem may continue to exist unless new policies are enacted to compensate the current void in services. A follow-up study to examine the current policies affecting the Anaheim homeless population would provide a strong foundation and direction for future policies.

Keywords: Homelessness, food insecurity, Anaheim, mental illness, physical illness, social support

Introduction

The dramatic increase in homelessness has drawn attention to a number of health related factors, including food security and hunger. Amidst the homelessness problem plaguing the U.S., food insecurity continues to affect the health of many Americans. The U.S. Department of Agriculture (USDA) defines food insecurity as limited or uncertain availability of nutritious and adequate food (Biggerstaff, Morris, & Nichols-Casebolt, 2002). During the past five years, the amount of food insecure households in the United States increased significantly from 10.5 million in 1999 to 13.5 million in 2004, representing approximately 38.2 million people (Nord et al., 2005). One of the Nation's health objectives, expressed in the U.S. Department of Health and Human Services' Healthy People 2010 plan, is to reduce the prevalence of food insecurity from 11.2 percent to 6 percent (Chambers, 2007; Derrickson & Brown, 2001; Nord et al., 2005).

Whether food insecurity has a direct effect on the duration of homelessness, or duration of homelessness on food insecurity, remains an open question. The scarcity of information on food insecurity among homeless persons is regrettable because such information can be instrumental in supporting an initiative to end homelessness.

Causes of Food Insecurity

Several factors have been found to be associated with food insecurity, including homelessness, demographic characteristics, mental and physical illness, and family life.

Homelessness

Oftentimes, homeless individuals have to compromise the quantity and quality of their

food in order to cope with a lack of funds (Engler-Stringer & Berenbaum, 2007). While national data indicate that a majority of people who live below the poverty line or have unstable incomes often fall victim to food insecurity, homeless people are most at risk (Booth & Smith, 2001; Chambers, 2007; Derrickson & Brown, 2001). At any given time, about 33 million people go hungry every year and about 3 million of them are homeless (NCH, 2006). Because food insecurity is highly prevalent among homeless people, they tend to be at a higher risk for acquiring serious health consequences such as malnutrition (Booth & Smith, 2001; Derrickson & Brown, 2001; Webb, Coates, Frongillo, Rogers, Swindale, & Bilinsky, 2006) and poorer health status (Biggerstaff, Morris, & Nichols-Casebolt, 2002; Derrickson & Brown, 2001; Engler-Stringer & Berenbaum, 2007).

Demographic Characteristics

Demographic characteristics such as age, gender, and ethnicity are associated with food insecurity. According to the USDA's report on Household Food Security in the United States (2005), Blacks and Hispanics were less likely to experience hunger and food insecurity. Several reports have also found rates of food insecurity with hunger higher among women and families headed by single women (Gundersen et al., 2003; Nord et al., 2005; Richards & Smith, 2006). Moreover, a study by Whitbeck and colleagues (2005) found age and gender to be contributing factors to food insecurity, specifically that older males were most likely to report food insecurity

Mental and Physical Illness

Psychological symptoms of homelessness include the anxiety, fear, and depression associated with coping with a lack of funds to obtain adequate food (Coates et al., 2006; Derrickson & Brown, 2001; Engler-Stringer & Berenbaum, 2007). A study by Gundersen, Weinreb, Wehler, and Iiosmer (2003) found that the mental health condition of the participant might increase their likelihood of food insecurity. For example, a homeless person afflicted with depression may not be in the right frame of mind to manage money to purchase food as well as when he or she is not depressed. Several studies have also found mental illness to be prevalent among homeless families (e.g., Early, 1998; Schoeni & Koegel, 1998) and much more prevalent in food insecure families (Gundersen et al., 2003).

Diabetes and high blood pressure have been noted as physical effects of food insecurity (Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007; Whinter, Rakhovskaya, Kaur, Yamada, Waller, & Khosla, 2007). Food insecurity has been found to be a risk factor for diabetes. Adults tend to consume high calorie, less nutritious food, which play a part in this relationship (Seligman et al., 2007). A study by Whinter and colleagues (2007) also suggested unhealthy eating behaviors influence the association between high blood pressure and food insecurity.

Family Life

Family is often a source of support, including socioeconomic support, during times of need. Previous literature suggests that the size of one's social network is associated with food security (Gundersen et al., 2003; Martin, Rogers, Cook, and Joseph, 2004; Whitbeck et al., 2005). A study by Hadley, Mulder, and Fitzherbert (2007) found an association between social support and food security, suggesting that social support may be a protective factor against the occurrence food insecurity. Homeless individuals, who lack social support, are more likely to change their eating patterns and resort to borrowing or stealing food (Coates et al., 2006).

Societal Impact of Food Insecurity among the Homeless

Food insecurity plays a major role in diminishing health status and quality of life for many disadvantaged groups in the U.S., especially the homeless population. Food insecurity also has several consequences that affect society as a whole (Biggerstaff, Morris, & Nichols-Casebolt, 2002). The cost to society can be rather high, with the homeless using a variety of public systems inefficiently (NCH, 2006). Some of these public systems include hospitals, prisons, jails, and emergency shelters (NCH, 2006). Homeless people spend an average of

four more days per hospital visit than non-homeless people with the same health issues, which translates to approximately $2,414 extra costs per hospitalization (Salit, Kuhn, Hartz, Vu, & Mosso, 1998). The cost of an emergency shelter bed is about $8,067 per year (County of Orange, 2008). Therefore, preventing episodes of homelessness and food insecurity may result in significant cost savings.

The Present Study

In 2007, Orange County was awarded $10.7 million in homeless assistance monies from the US Department of Housing and Urban Development (HUD). The regional nature of homelessness makes it easier for a city such as Anaheim to address, since the homeless population in Anaheim is heavily concentrated within the city parks, motels, and emergency shelters (City of Anaheim, 2007). In 2007, there were an estimated 1,542 to 3,280 homeless individuals in Anaheim and of these, 400 to 1,200 were chronically homeless (City of Anaheim, 2007). In order to assess the issues and challenges that homeless residents of Anaheim face, including food insecurity, the 2007 Anaheim Community Services Survey of Homeless Persons was created. Eighty-five homeless Anaheim residents voluntarily participated in the survey, and their data was utilized in this study.

The purpose of this study was to examine the existing data collected from the 2007 Survey of Homeless Persons to determine whether food insecurity was associated with: (1) homelessness, (2) demographic characteristics, (3) mental illness, and (4) family life. Based upon previous research, we expected that: (1) longer duration of homelessness, (2) demographic characteristics such as age, gender, and ethnicity, (3) number of schizophrenic symptoms, and (4) not having a spouse or local relative were associated with higher levels of food insecurity.

Methods

Participants

A total of 100 homeless Anaheim residents were interviewed. Of these, 85 surveys were accepted as complete and within the restrictions set by the Community Services department, which required participants to be men and women between the ages of 18 to 65 years old who have spent at least 24 hours within the City of Anaheim. There were no medical or psychiatric exclusion criteria. Strategic attempts were made to reach individuals in various environments, thus participants were recruited at the following locations:

- Impacted parks in Anaheim (La Palma, Schweitzer, Reid, Pearson, Boysen, and Modjeska)
- Impacted library in Anaheim (Central)
- Mary's Kitchen in Orange
- Fullerton Armory- Cold and Wet Weather Shelter
- Faith-based organization meal services in Anaheim, Fullerton, and Garden Grove
- Santa Ana Riverbed
- Orange County Homeless Court

Homeless individuals who voluntarily agreed to participate in the study were assured that their responses would remain anonymous and confidential, thus giving them the ability to be candid in their responses to the survey questions.

Procedure

A major component of the study consisted of comprehensive one-on-one interviews conducted by trained city staff and volunteers. There were three primary methods of contact with homeless persons who participated in the survey. They were: (1) interviews with homeless persons who were contacted on the streets and in community parks (e.g. La Palma, Schweitzer, Reid, Pearson, Boysen, and Modjeska); (2) interviews with homeless persons who were contacted in shelters (e.g. the Fullerton Armory); and (3) interviews with homeless persons who were contacted at meal services targeting the homeless (e.g. Calvary Chapel's Saturday morning breakfasts, Mary's Kitchen in Orange). Each location was visited during the specific hours that they were open for service, excluding community parks and streets. For example, the Fullerton Armory is only accessible between the hours of 6 p.m. to 6 a.m. from December 1 to March 31. The dates were selected according to the availability of

interviewers and based on each location's hours and days of service. Survey interviews were administered on the selected dates in a private area within the assessment location. Two or more interviewers were present during each interview date. Interviews were conducted in English only and lasted approximately 20 minutes.

City staff and volunteers were trained to conduct the interviews with homeless adults, using the one-on-one survey instrument. A training session led by the Community Services Supervisor included project background information, detailed instruction on respondent eligibility, interviewing etiquette, prompting for detailed response, and confidentiality. Using trained interviewers as opposed to self-administered surveys increased the chance of obtaining complete and accurate answers to the questions. For this reason, no self-administered surveys were accepted.

Interviewers administered surveys to homeless persons living on the streets, as well as those in shelters and meal program facilities. The same survey was used in all environments. Interviewers were asked to remain unbiased at all times, to make no assumptions or use prompts, and to ask all questions. Respondents were allowed to skip any questions they did not feel comfortable answering. During the interviews, respondents were encouraged to be candid in their responses and were informed that these responses would be framed as general findings, would be kept confidential, and would not be traceable to any one individual.

An identifier was used to prevent duplication of survey respondents without compromising the respondents' anonymity. Upon completion of the survey effort, an extensive verification process was conducted to eliminate potential duplicates. The process examined the identifier, which consisted of a string of letters that include the first initial of the first name, first initial of the last name, gender, ethnicity, age, and state born for each survey respondent. If two of the same identifiers appeared, then it was assumed that the two were the same person and only one full survey response was included in the study.

The study was conducted in accord with APA policy, under ethical guidelines overseen by the California State University, Fullerton Institutional Review Board.

Measurements

The "Anaheim Community Services Survey of Homeless Persons" was used. This survey was a modification of the City of Pasadena's 2004 Homeless Survey and the County of Riverside's 2004 Homeless Survey. Both surveys were shown to have good test-retest reliability for the indicator labeled "meals," which measured the average amount of meals per day that the homeless individual consumed, whether this amount has changed since becoming homeless, and the means by which the meal was obtained (City of Pasadena, 2007). These questions were adapted from the United States Department of Agriculture's (USDA) Guide to Measuring Household Food Security.

The survey of homeless persons was conducted in order to obtain quantitative data about the homeless community, data that could be utilized to inform future program development and planning. A total of 96 closed-ended and multiple response questions were used to elicit responses. Participants had the option to refuse to answer any of the questions. The categories that were used in our analyses are as follows:

Food security

Food security was the primary dependent variable of the study. Four items, which were adapted from the USDA's Guide to Measuring Household Food Security (2005), were used to measure food security. On the survey, these questions fell under the category "Meals." Question 19 asked "How many meals do you usually eat each day?" Response options were 1 = "1," 2 = "2," 3 = "3 or more," 4 = "Less than one due to lack of appetite," and 5 = "Refused." Less than one due to lack of appetite and refused responses were recoded to system-missing. Availability of food was measured by the following three questions: "Have you been able to obtain food when needed?"; "Have you had to skip meals in the past month because there was not enough money to buy food?"; "Have you ever stolen food to eat?" The responses to these

questions were: 1 = "Yes," 2 = "No," and 3 = "Refused." For the analyses, "No" was recoded to 0 and 3 was recoded to system-missing.

Duration of homelessness

Duration of homelessness was one of the independent variables used in the study. To measure the duration of homelessness, an individual was asked, "How long have you been currently homeless?" Response options included: 1 = "Less than one year," 2 = "One year or more," and 3 = "Refused." Episodic or transitionally homeless periods were measured using the following, "If you have been homeless for less than one year, how long has it been?" Response options included: 1 = "One week or less," 2 = "One month or less," 3 = "Three months or less," 4 = "Six months or less," 5 = "Not applicable," and 6 = "Refused." Chronically homeless periods were measured using the following, "If you have been homeless for one year or longer, how long has it been?" Response options were 1 = "One-two years," 2 = "Three years or more," 3 = "Five years or more," 4 = "Ten years or more," 5 = "Not applicable," and 6 = "Refused." Not applicable and refused responses were recoded to system-missing. These three questions were combined to obtain an estimate of the number of weeks of homelessness. This variable was labeled "Duration of Homelessness."

Family life

Family life was another independent variable that was used. To assess family life, one question was asked, "Do you have family who live in Anaheim?" Response options included 1 = "Yes," 2 = "No," and 3 = "Refused." The responses were recoded to the following: 1 = "Yes," 0 = "No," and System-missing = "Refused."

Mental illness

Mental illness was another independent variable that was used in the study. Seven items were used to assess mental illness, which was categorized as "mental health" on the survey. Response options for all of these items were 1 = "Yes," 2 = "No," and 3 = "Refused." The questions were the following: "Have you ever heard voices or seen things that no one else could hear or see?"; "Have you ever felt that your mind or body was being secretly controlled or controlled somehow against your will?"; "Have you ever felt that others wanted to hurt you or really get you for some special reason?"; "Do you feel that you have any special powers of some sort?"; "Have you ever had any other strange, odd, or very peculiar things happen to you?"; "Have you ever felt influenced by machines, radio waves, TV, radar, etc.?"; "Are you currently taking any psychotropic (psychiatric) medications?" After recoding, the items were combined to create a total score. This variable was labeled "Symptoms of Schizophrenia." Cronbach's alpha for these 7 items was 0.68.

Physical illness

Physical illness was another independent variable that was used in the study. Ten items were used to assess current physical illnesses, which were categorized as "health" on the survey. Response options for all of the items were 1 = "Yes," 2 = "No," and 3 = "Refused." The physical illnesses that were assessed were the following: asthma, diabetes, heart trouble, high blood pressure, hypertension, respiratory problems, seizures, strokes, and tuberculosis." After recoding, the items were combined to create a total score. This variable was labeled "Physical Illness Symptoms."

Demographic characteristics

Demographic characteristics that were taken into consideration in this study included: age, gender, and race/ethnicity.

Data Analysis

Data was analyzed using SPSS version 15.0 (SPSS Inc, Chicago, Ill). Descriptive statistics were calculated for the demographic characteristics, duration of homelessness, family life, and mental and physical illness. Next, linear and logistic regressions were calculated to compare food secure persons and food insecure persons on all of the aforementioned variables ($\alpha = .05$). Logistic regression models were performed to examine whether food insecurity was associated with demographic characteristics, duration of homelessness, family life, and mental and physical illness, both before and

after controlling for demographic covariates. To test these conditions, the following analyses were performed: (1) linear regression of "how many meals do you usually eat each day?" (dependent variable) on demographic characteristics, duration of homelessness, family life, and mental and physical illness (independent variables), (2) logistic regression of each meals variable (the dependent variables) on demographic characteristics, duration of homelessness, family life, and mental and physical illness (independent variables).

Results

Descriptive statistics of the sample

Table 1 displays descriptive statistics of the sample. More than half of the participants (56.5%) reported that they were White and a majority (75.3%) of them was male. Of the 85 participants, 18 (21.2%) of them reported being homeless for six months or less, 21 (24.7%) of them reported being homeless for one to two years, and 10 (11.8%) of them reported being homeless for more than ten years. The majority of the respondents reported that they completed high school (34.1%), with a smaller portion having completed some college or post-high school (21.2%). Most of the participants (23.5%) fell in between the age range of 40 to 49 years old. A majority (72.9%) of the participants reported not having any family who live in Anaheim and slightly more than half (56.5%) do not access any government resources. Approximately 24.7% of them reported having no physical illness symptoms and 42.4% of them reported having no symptoms of schizophrenia. The mean number of meals eaten per day was 1.8 (SD = 0.8). The majority (69.4%) of the participants reported being able to obtain food when needed; 70.6% reported having to skip meals in the past month due to financial restraints; and 22.4% reported stealing food to eat.

Characteristics of the sample by food security status

Table 2 displays ANOVA, chi-square and Pearson's correlation coefficient statistics that examined differences among food secure and food insecure participants on demographic characteristics, duration of homelessness, family life, and mental and physical illness. No significant associations were found between food insecurity and duration of homelessness, family life, or physical illness.

Associations between demographic characteristics, mental illness, and food insecurity

Table 3 displays the direct associations of demographic characteristics and food insecurity. These associations were presented as odds ratios obtained from the logistic regression models, both unadjusted and adjusted for the other demographic covariates. Associations for linear regression were presented as betas, both unadjusted and adjusted for demographic covariates. Race/ethnicity (β^2 = -.27) was associated with meals eaten per day ($p < .05$). Whites were more likely to eat fewer meals per day than Non-whites. Gender (AOR = 5.80) was strongly associated with being able to obtain food when needed ($p < .01$). Thus males had a better chance of obtaining food when needed than females. Both age (AOR = 0.57) and history of schizophrenia (AOR = 1.72) were strongly associated with having ever stolen food to eat ($p < .01$). As age increased, the likelihood of stealing food to eat also increased; and as the number schizophrenic symptoms increased, so did the likelihood of stealing food to eat. Since the adjusted odds ratio for age was significantly lower than one indicated that age had protective effects against food insecurity. Therefore the adjusted odds ratio of 0.57 for age in the food insecurity model suggests that participants were 57% as likely to have stolen food to eat compared to participants who were one point lower than them on age.

Discussion

The present study provided evidence that individual characteristics (age, gender, race/ethnicity, and history of schizophrenia) were strongly associated with food insecurity. Our outcomes suggest that an intervention is necessary that targets these demographic groups. Results from this study will ultimately provide the rationale for government agencies, such as the City of Anaheim, to consistently provide

important resources to the homeless, such as shelters, meal programs and health services.

No association was found between food insecurity and duration of homelessness or family life. The lack of association between food insecurity and duration of homelessness may in fact be a positive indicator that Anaheim's homeless residents are able to obtain food when needed, regardless of how long they have been homeless. However, the lack of association between food insecurity and family life indicates that family support does not increase one's chances of being food secure.

Further investigation of the number of physical illness symptoms was also not significantly associated with food insecurity. Although previous research has found diabetes and high blood pressure to be risk factors for food insecurity, in our sample this was not the case (Seligman et al., 2007; Whinter et al., 2007). This may be due to the potential biases associated with participants' reports of health conditions and concerns. Our expectation is that physical illness symptoms were probably underreported by the participants.

Our results indicated that Whites were more likely to eat fewer meals per day than Non-whites. This may be due to the fact that Non-whites utilize food resources, such as meal programs and food pantries, more than Whites. Findings from the USDA's report on Household Food Security in the United States (2005), illustrated that the use of food pantries was higher among Blacks and Hispanics. Non-whites may also have the added support of family and friends, who can provide them with food and money. Previous literature also suggested that the size of one's social network was associated with food security (Gundersen et al., 2003; Martin, Rogers, Cook, and Joseph, 2004; Whitbeck et al., 2005). Since Blacks and Hispanics may have larger social networks than Whites, their likelihood of food insecurity is less. Small social networks and low rates of food resource usage were both attributable to the likelihood of suffering from food insecurity and hunger.

Although the findings indicated that seventy percent of participants reported being able to obtain food when needed, almost three-fourths of the adults interviewed also responded positively to skipping meals in the past month due to financial restraints. This was consistent with studies that have found economic restraints to be strongly associated with food insecurity (e.g., Dachner & Tarasuk, 2002; Furst, Connors, Bisogni, Sobal, & Falk, 1996; Reicks, Randall, & Haynes, 1994; Richards & Smith, 2006; Whitbeck, Chen, & Johnson, 2005). These results indicate that the amount of free food resources that are offered in the City of Anaheim are insufficient. Increasing the amount of free food resources may relieve some of the economic restraint that the homeless population faces.

Males had a better chance of obtaining food when needed than females. One possible explanation of this finding is that women tend to put their children's needs before their own. Many women report skipping meals, eating less, and sacrificing food in order to provide enough food for their children (Richards & Smith, 2006). Such hardship has encouraged many of these women to resort to deviant means of obtaining food, such as stealing, panhandling, and prostitution (Gundersen et al., 2003; Richards & Smith, 2006; Whitbeck et al., 2005). Our findings are consistent with existing literature that has found rates of food insecurity with hunger higher among women and families headed by single women (Gundersen et al., 2003; Nord et al., 2005; Richards & Smith, 2006). Thus, obtaining food when needed has proven to be a difficult task for women and families headed by single women.

On the contrary, a study by Whitbeck and colleagues (2005) found that older males were most likely to report food insecurity. Older males in this study were more likely to respond positively to at least one of the food insecurity items (i.e., cutting or skipping meals, not eating for a whole day, and/or reporting hunger because they could not afford food). This contradiction from our findings may be due to differences in sample characteristics. Our sample consisted of homeless individuals that

were surveyed in a variety of locations, whereas Whitbeck and colleagues' (2005) study mostly surveyed those who actively sought assistance from food pantries and emergency shelters. However, it is unknown whether or not our sample utilized emergency shelters in general, which makes the two samples incomparable. The prevalence of hunger and food insecurity is higher among those persons participating in food assistance programs than that of nonparticipating persons (Whitebeck et al., 2005).

Most participants in our study resorted to non-deviant means of obtaining food (i.e., soup kitchens, homeless shelters, and food pantries). However, nearly 1 in 4 reported stealing food to eat. Again, this may be due economic restraints. When participants did not have enough money to purchase food, they had to seek charitable food resources, go without food, or steal it.

Age was also strongly associated with stealing food to eat. Thus, as age increased, so did the likelihood of food insecurity. According to the USDA's report on Household Food Security in the United States (2005), elderly members (50 years and older) were less likely to use food pantries than any other age group. This was attributable to the fact that many of the participants were unaware of the availability and locations of food pantries. However, the report indicated that the quantity of available food resources has increased over the years (Nord et al., 2005). Our findings were indicative of the USDA's report, showing that although food resources have increased over the years, older homeless people lack information on how to access food resources. In turn, the younger generations of homeless people do not have to resort to stealing food as much as the older generations because they are aware of the food resources available to them.

The number of schizophrenia symptoms was strongly associated with stealing food to eat. This finding was consistent with a study by Gundersen, Weinreb, Wehler, and Iiosmer (2003), who found that the mental health condition of the participant might increase their likelihood of food insecurity. Other studies have found mental illness to be prevalent among homeless families (e.g., Early, 1998; Gundersen et al., 2003; Schoeni & Koegel, 1998) and much more prevalent in food insecure families (Gundersen et al., 2003). Therefore, having symptoms of schizophrenia has a negative impact on food security, which may result in participants' resorting to deviant means of obtaining food (i.e., stealing food).

Limitations

Several limitations of the present study need to be considered. One primary goal was to administer the survey to homeless persons who were considered chronically homeless. From the outset, the aforementioned criteria proved extremely difficult to satisfy, and therefore the target population was expanded to include any duration of homelessness. Also, the sample size was relatively small, which decreased the likelihood of obtaining statistically significant findings.

Because the design of this study was cross-sectional, causal relationships between variables cannot be inferred. For example, the findings from our research supported a reasonable path from homelessness to food insecurity through lack of social support. However, we cannot be completely certain that homelessness precedes the occurrence of food insecurity, and the reverse direction of causality may also be likely. A longitudinal study is needed to clarify the correlation between homelessness and food insecurity.

Second, our sample was limited to homeless adults who frequent the City of Anaheim. Although this approach documents homeless adults in a city where they are often overlooked, the findings may not be generalizable to other geographic areas. Because a convenience sample study design was employed rather than random sampling, the extent to which the survey respondents are representative of the homeless population in Anaheim is unknown.

The results of the study are entirely based on participants' self-reports to an interviewer. Although the participants were assured that their responses were anonymous, they may have

underreported stealing food to eat in fear of retribution from the City staff members conducting the interviews. Also, all of our measures may present potential biases associated with participants' reports of health conditions and concerns. Our expectation is that mental illness symptoms were probably underreported by the participants. On the other hand, using an interviewing method may have ruled out any biases in responses due to miscomprehension of the questions, and may have facilitated a candid rapport that yielded truthful answers. Lastly, using only three of the USDA's food security measurements may not have captured all aspects of food insecurity (see Guide to Measuring Household Food Security, p.16).

Conclusion

Homeless Anaheim residents are vulnerable to food insecurity and a number of other health risks. In our sample of homeless Anaheim residents, we found that older White males who were vulnerable to schizophrenia had higher levels of food insecurity. Our findings suggest that an intervention is necessary that targets these individuals. Conducting intensive outreach to homeless persons is a critical piece of an effective communitywide strategy to reduce homelessness. Many homeless persons have developed a significant level of mistrust of others, due to negative experiences in seeking assistance from particular programs. For this reason, persons experienced in relationship building with homeless persons are needed for intensive outreach efforts.

Oftentimes, there are not enough outreach and food programs available to the homeless community. To target the community, the City of Anaheim may consider assisting with the development of a drop-in facility. Such a facility could offer a place for homeless persons to connect to services, such as mental health care, which would aid them in transitioning off the streets. The City of Santa Monica currently houses three drop-in facilities, which offer emergency services such as food, clothing, showers, medical and mental health care, and case management (City of Anaheim, 2005). Drop-in centers allow homeless persons struggling with issues of mistrust to utilize services while developing trusting relationships at a pace more comfortable to them. Collaborative partnerships can also be established between the City of Anaheim and organizations, such as the Orange County Rescue mission, in order to cover much more ground in providing services to the homeless community.

Although the present study was limited in range, the results demonstrate the existence of food insecurity among the homeless of Anaheim. This problem may continue to exist unless new policies are enacted to compensate the current void in services. A follow-up study to examine the current policies affecting the Anaheim homeless population would provide a strong foundation and direction for future policies. Further research on the relationship between food insecurity and homelessness may also shed light on how public health professionals can help reduce the national rate of food insecurity. Without a sufficient amount of support and services, homeless people are kept in limbo – struggling to escape poverty while fighting every day to survive with enough food to eat.

References

Anderson, S. (1990). The 1990 Life Sciences Research Office (LSRO) report on nutritional assessment: Core indicators of nutritional state for difficult to sample populations. *Journal of Nutrition*, *102,* 1559-1660.

Biggerstaff, M., Morris, P., & Nichols-Casebolt, A. (2002). Living on the edge: Examination of people attending food pantries and soup kitchens. *Social Work*, *47,* 267-277.

Booth, S., & Smith, A. (2001). Food security and poverty in Australia – challenges for dietitians. *Australian Journal of Nutrition and Dietetics*, *58,* 150-156.

Burt, M., Aron, L., Lee, E., & Valentie, J. (2001). Helping America's homeless: Emergency shelter or affordable housing? Washington, D.C.: The Urban Institute Press.

Chambers, R. (2007). An exploratory study of local food affordability and factors related to household food security and food purchasing decisions. *Internet Journal of Health*, *5,* 2-2.

City of Anaheim. (2007). Experiencing homelessness: Homelessness in Anaheim, 2007. Retrieved August 19, 2008, from http://www.anaheim.net/comm_svc/pdf/faq1.pdf

City of Pasadena. (2007). Pasadena: 10-year strategy to end homelessness. Retrieved August 20, 2008, from http://www.homeless-research.com

Coates, J., Frongillo, E., Rogers, B., Webb, P., Wilde, P., & Houser, R. (2006). Advances in developing country food insecurity measurement. *Journal of Nutrition*, *136,* 1438S-1448S.

County of Orange. (2008). Orange County 2008 community indicators report. Retrieved August 19, 2008, from http://egov.ocgov.com/vgnfiles/ocgov/OCGOVPortal/docs/CIR2008.pdf

County of Orange. (2007). Orange County 2007 housing and community services business plan. Retrieved August 19, 2008, from http://egov.ocgov.com/vgnfiles/ocgov/CEO/Docs/HCS_07.pdf

Dachner, N., & Tarasuk, V. (2002). Homeless "squeegee kids": Food insecurity and daily survival. *Journal of Social Science & Medicine, 54,* 1039-1049.

Derrickson, J., & Brown, A. (2001). Food security stakeholders in Hawaii: Perceptions of food security monitoring. *Journal of Nutrition Education*, *33,* 1-13.

Diamond, P., & Schneed, S. (1991). Lives in the shadows: Some of the costs and consequences of a "non-system" of care. Austin, Texas: *Hogg Foundation for Mental Health*.

Early, D. (1998). The role of subsidized housing in reducing homelessness: An empirical investigation using micro-data. *Journal of Policy Analysis and Management*, *17*, 687-696.

Engler-Stringer, R., & Berenbaum, S. (2007). Exploring food security with collective kitchens participants in three Canadian cities. *Qualitative Health Research*, 17, 75-84.

Furst, T., Connors, M., Bisogni, C., Sobal, J., & Falk, L. (1996).Food choice: A conceptual model of the process. *Appetite*, *26*, 247-266.

Gregson, J., Foerster, S., Orr, R., Jones, L., Benedict, J., & Clarke, B. (2001). System, environmental, and policy changes: Using the social-ecological model as a framework for evaluating nutrition education and social marketing programs with low-income audiences. *Journal of Nutrition Education*, *33,* S4-S14.

Gundersen, C., Weinreb, L., Wehler, C., & Iiosmer, D. (2003). Homelessness and food insecurity. *Journal of Housing Economics*, *12*, 250-272.

Hadley, C., Mulder, M., & Fitzherbert, E. (2007). Seasonal food insecurity and perceived social support in rural Tanzania. *Public Health Nutrition, 10,* 544-551.

Martin, K., Rogers, B., Cook, J., & Joseph, H. (2004). Social capital is associated with decreased risk of hunger. *Journal of Social Science and Medicine*, 58, 2645-2654.

McIntyre, L. (2003, March 1). Food security: More than a determinant of health. Policy Options, 46-51.

McLeroy, K., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly, 15,* 351-377.

National Coalition for the Homeless. (2006). Why are people homeless? Washington, D.C.: National Coalition for the Homeless.

National Law Center on Homelessness and Poverty. (1994). No homeless people allowed. Washington, D.C.: National Law Center on Homelessness and Poverty.

Nord, M., Andrews, M., & Carlson, S. (2005). Household food security in the United States 2004 (FANRR-42). Washington, D.C.: USDA Economic Research Service.

Nord, M., & Hopwood, H. (2007). Recent advances provide improved tools for measuring children's food security. *The Journal of Nutrition*, *137,* 533-536.

Quindlen, A. (2003, December 1). A new kind of poverty. *Newsweek*, *142*, 76-76.

Rainville, A. (2001). Nutritional quality of reimbursable school lunches compared to lunches brought from home. *The Journal of Child Nutrition & Management*, *40,* 454-61.

Reicks, M., Randall, J., & Haynes, B. (1994). Factors affecting consumption of fruits and vegetables by low-income families. *Journal of the American Dietitians Association*, *94*, 1309-1311.

Richards, R., & Smith, C. (2006). The impact of homeless shelters on food access and choice among homeless families in Minnesota. *Journal of Nutrition Education and Behavior*, *38*, 96-105.

Rosenthal, R., & Foscarinis, M. (2006). Responses to homelessness: Past policies, future directions, and a right to housing. In R. Bratt, M. Stone, & C. Hartman (Eds.), A right to housing: Foundation for a new social agenda (p. 322). Philadelphia, PA: Temple University Press.

Salit, S., Kuhn, E., Hartz, A., Vu, J., & Mosso, A. (1998). Hospitalization costs associated with homelessness in New York City. *New England Journal of Medicine*, *338*, 1734-1740.

Schoeni, R., & Koegel, P. (1998). Economic resources of the homeless: Evidence from Los Angeles. *Contemporary Economic Policy, 16,* 295-308.

Seligman, H., Bindman, A., Vittinghoff, E., Kanaya, A., & Kushel, M. (2007). Food insecurity is associated with diabetes mellitus: Results from the National Health Examination and Nutrition Examination Survey (NHANES) 1999-2002, *Journal of General Internal Medicine*, *22,* 1018-1023.

Triplett, W. (2004). Ending Homelessness. The CQ Researcher, 14, 541-564.

U.S. Department of Housing and Urban Development. (2004). Strategies for reducing chronic street homelessness. Washington, D.C.: U.S. Department of Housing and Urban Development.

U.S. Department of Health and Human Services. (2003). Ending chronic homelessness: Strategies for action. Washington, D.C.: U.S. Department of Health and Human Services.

U.S. Interagency Council on Homelessness. (n.d.). Guide to developing a 10 year plan. Retrieved May 8, 2007, from http://www.ich.gov

Webb, P., Coates, J., Frongillo, E., Rogers, B., Swindale, A., & Bilinsky, P. (2006). Advances in Developing Country Food Insecurity Measurement. *Journal of Nutrition*, *136*, 1404S-1408S.

Whinter, J., Rakhovskaya, M., Kaur, D., Yamada, N., Waller, R., & Khosla, P. (2007). Assessing the impact of diet and healthcare in a faith-based, nonprofit rescue shelter in metropolitan Detroit. *Journal of the Federation of American Society For Experimental Biology*, *21*, A170.

Whitbeck, L., Chen, X., & Johnson, K. (2005). Food insecurity among homeless and runaway adolescents. *Public Health Nutrition*, *9*, 47-52.

Wilde, P., & Peterman, J. (2006). Individual weight change is associated with household food security status. *Journal of Nutrition*, *136,* 1395-1400.

Worsnop, R. (1996). Helping the Homeless. *The CQ Researcher*, *6,* 73-96.

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Appendix A

Table 1.
Descriptive statistics of the sample

	M	*SD*
Dependent variables		
Meals eaten per day	1.8	0.8
	n	%
Able to obtain food when needed		
Yes	59	69.4
No	26	30.6
Skipped meals due to financial restraints (past month)		
Yes	60	70.6
No	25	29.4
Ever stolen food to eat		
Yes	19	22.4
No	66	77.6
Independent variables		
Duration of homelessness (weeks)		
Refused	4	4.7
One week or less	3	3.5
One month or less	6	7.1
Three months or less	6	7.1
Six months or less	18	21.2
One-two years	21	24.7
Three years or more	8	9.4
Five years or more	9	10.6
Ten years or more	10	11.8
Have family who live in Anaheim		
Yes	22	25.9
No	62	72.9
Covariates		
Highest grade of school completed		
8^{th} grade or less	5	5.9
11^{th} grade or less	17	20.0
Completed high school	29	34.1
Some college or post-high school	18	21.2
Junior college graduate	5	5.9

Table 1.
Descriptive statistics of the sample (Continued)

	n	%
Education		
College graduate	8	9.4
Post-graduate	2	2.4
Gender		
Male	64	75.3
Female	21	24.7
Race/Ethnicity		
White	48	56.5
Non-white	37	43.5
Duration of homelessness (weeks)		
Refused	4	4.7
One week or less	3	3.5
One month or less	6	7.1
Three months or less	6	7.1
Six months or less	18	21.2
One-two years	21	24.7
Three years or more	8	9.4
Five years or more	9	10.6
Ten years or more	10	11.8
Age (years)		
18-24	3	3.5
25-29	6	7.1
30-39	15	17.6
40-49	20	23.5
50-54	17	20.0
55-59	12	14.1
60-61	4	4.7
62-64	3	3.5
65-69	3	3.5
70+	1	1.2
Number of physical illness symptoms		
0	21	24.7
1	11	12.9
2	15	17.6
3	9	10.6
4	10	11.8
5	8	9.4
6	4	4.7
7	4	4.7
Number of schizophrenia symptoms		
0	36	42.4
1	14	16.5
2	13	15.3
3	10	11.8
4	5	5.9
5	2	2.4
7	1	1.2

Note: Frequencies for each variable do not add up to the total sample size because of missing responses.

Appendix B

Table 2.
Characteristics of the sample by food security status (n = 85)

	Meals eaten per day		Able to obtain food when needed		Skipped meals due to financial restraints (past month)		Ever stolen food to eat	
	M	SD	n	%	n	%	n	%
Independent Variables								
Duration of homelessness (weeks)								
Refused	1.33	0.58	2	3.40	3	5.00	0	0.00
One week or less	1.67	1.16	2	3.40	3	5.00	1	5.30
One month or less	2.17	0.41	5	8.50	5	8.30	0	0.00
Three months or less	1.50	0.55	5	8.50	4	6.70	0	0.00
Six months or less	1.78	0.73	12	20.30	14	23.30	7	36.80
One-two years	1.76	0.77	13	22.00	14	23.30	4	21.10
Three years or more	1.71	0.76	3	5.10	6	10.00	2	10.50
Five years or more	1.89	0.78	8	13.60	5	8.30	3	15.80
Ten years or more	1.80	0.79	9	15.30	6	10.00	2	10.50
ANOVA/χ^2	F=0.49		χ^2=9.88		χ^2=4.00		χ^2=8.47	
Proximity to family								
Yes	1.72	0.71	16	27.10	14	23.30	4	21.10
No	1.91	0.75	43	72.90	46	76.70	15	78.90
ANOVA/χ^2	F=1.10		χ^2=0.09		χ^2=0.89		χ^2=0.34	

Table 2.
Characteristics of the sample by food security status (Continued)

	Meals eaten per day		Able to obtain food when needed		Skipped meals due to financial restraints (past month)		Ever stolen food to eat	
	M		SD		n		%	
Covariates								
Gender								
Female	1.75	0.72	10	16.90	15	25.00	2	10.50
Male	1.78	0.73	49	83.10	45	75.00	17	89.50
ANOVA/χ^2	F=0.02		χ^2=6.24*		χ^2=0.01		χ^2=2.65	
Race/Ethnicity								
White	1.60	0.71	32	54.20	36	60.00	11	57.90
Non-white	2.00	0.68	27	45.80	24	40.00	8	42.10
ANOVA/χ^2	F=6.86**		χ^2=0.39		χ^2=1.03		χ^2=0.02	
Age (years)								
18-29	1.78	0.67	4	6.80	8	13.30	7	36.80
30-39	1.87	0.74	10	16.90	11	18.30	4	21.10
40-49	2.00	0.73	17	28.80	14	23.30	3	15.80
50-54	1.65	0.86	14	23.70	11	18.30	2	10.50
55-59	1.73	0.65	8	13.60	8	13.30	2	10.50
60+	1.45	0.52	6	10.20	8	13.30	1	5.30
ANOVA/χ^2	F=0.99		χ^2=7.60		χ^2=1.91		χ^2=18.99**	
Education								
11th grade or less	1.81	0.68	18	30.50	15	25.00	6	31.60
High school graduate	1.83	0.66	20	33.90	20	33.30	6	31.60
Some college/Junior college graduate	1.65	0.78	13	22.00	18	30.00	5	26.30
College/Post-graduate	1.80	0.92	8	13.60	7	11.70	2	10.50
ANOVA/χ^2	F=0.29		χ^2=3.96		χ^2=0.74		χ^2=0.38	

Table 2
Characteristics of the sample by food security status (Continued)

Number of physical illness symptoms								
0	1.71	0.72	11	19.00	16	27.10	7	36.80
1	1.73	0.65	9	15.50	7	11.90	2	10.50
2	1.93	0.80	13	22.40	10	16.90	3	15.80
3	1.56	0.53	6	10.30	8	13.60	2	10.50
4	1.90	0.74	8	13.80	5	8.50	4	21.10
5+	1.73	0.80	11	19.00	13	22.00	1	5.30
Pearson's correlation coefficient/χ^2	r=0.02		χ^2=6.43		χ^2=5.12		χ^2=5.63	
Number of schizophrenic symptoms								
0	1.69	0.71	26	45.60	27	45.80	4	22.20
1	1.93	0.73	12	21.10	9	15.30	2	11.10
2	1.69	0.63	7	12.30	10	16.90	4	22.20
3	1.89	0.78	6	10.50	7	11.90	4	22.20
4+	1.63	0.74	6	10.50	6	10.20	4	22.20
Pearson's correlation coefficient/χ^2	r=0.01		χ^2=3.94		χ^2=0.77		χ^2=9.03*	

*p< .05, **p< .01, ***p< .0001

Note: Frequencies for each variable do not add up to the total sample size because of missing responses.

Appendix C

Table 3
Associations between demographic characteristics and food insecurity

	Meals eaten per day		Able to obtain food when needed		
	β	β	OR	95% CI	AOR
Covariates					
Age	-0.17	-0.19	1.03	0.62-1.34	0.91
Education	-0.05	-0.08	0.80	0.38-1.11	0.65
Gender	0.08	0.12	3.59*	1.71-19.74	5.80**
Schizophrenia Symptoms	0.01	-0.04	0.89	0.55-1.19	0.81
Physical Illness	0.02	0.03	1.13	0.80-1.48	1.09
Race/Ethnicity	-0.19	-0.27*	0.74	0.24-2.19	0.72

*p< .05, **p< .01, ***p< .0001

Table 3
(Continued)

	Skipped meals due to financial restraints (past month)			Ever stolen food to eat		
	OR	95% CI	AOR	OR	95% CI	AOR
Covariates						
Age	0.88	0.59-1.19	0.84	0.54**	0.35-0.93	0.57*
Education	1.13	0.71-2.06	1.21	0.88	0.47-1.73	0.90
Gender	0.95	0.11-1.89	0.46	3.44	0.82-26.51	4.66
Schizophrenic Symptoms	0.99	0.65-1.39	0.95	1.74**	1.11-2.65	1.72*
Physical Illness	1.01	0.85-1.55	1.15	0.84	0.56-1.23	0.83
Race/ Ethnicity	1.63	0.55-4.23	1.52	1.08	0.50-6.47	1.80

*p< .05, **p< .01, ***p< .0001