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Food Insecurity and Depressive Symptoms: Comparison of Drug Using and Nondrug-Using Women at Risk for HIV

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Abstract

Food insecurity has been linked to poor physical and mental health as well as HIV risk behaviors. While prior research has shown that drug users are prone to food insecurity it is unclear if drug use exacerbates the physical and psychosocial consequences. A sample of women who used drugs (DU) (specifically heroin and cocaine) and women who did not use drugs (NDU) were examined to determine if the relationship between food insecurity and depression varied by drug use status. Approximately 29% (n=128) of the total sample experienced food insecurity. DU women were more likely to be food insecure. There were no differences in receiving food stamps. After controlling for demographics and receiving food stamps, a significant association between food insecurity and depression existed for both DU and NDU women. The strength of this association was approximately double for NDU women. The study results suggest that it is critical to integrate mental health, food assistance, and other services.

Introduction

In 2011, 14.9% of households in the US experienced food insecurity with approximately 5.7% reporting severe food insecurity levels (A. Coleman-Jensen, Nord, Andrews, & Carlson, September 2012). Further, single female-headed households with children experience food insecurity at a staggering rate of 35.1% (A. J. Coleman-Jensen, 2011). African Americans and residents of major cities also face a significantly higher burden of

food insecurity, with nationwide rates at 25.1% and 17.0%, respectively (A. J. Coleman-Jensen, 2011).

Due to traditional household responsibilities and child rearing, woman may be more impacted by food insecurity compared to men (Ivers & Cullen, 2011). Previous research has shown an association between food insecurity and excess weight in adult women (Dinour, Bergen, & Yeh, 2007; Franklin et al., 2012). In a study of nearly 10,000 adults, Townsend and colleagues (2001) found a significant association between food insecurity and obesity among women even after adjusting for socioeconomic factors but found no such association in men.

Food-insecure households are less likely to have access to health care and may see food security and health care as competing priorities (Kushel, Gupta, Gee, & Haas, 2006). Food insecurity has been associated with lower self-reported physical and mental health (Stuff et al., 2004; Vozoris & Tarasuk, 2003) and poor nutritional status (Bhattacharya, Currie, & Haider, 2004). Adults in food insecure households are also more likely to suffer from type 2 diabetes (Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007). In addition, food insecurity has been associated with increased morbidity and healthcare utilization as well as low medication adherence, among HIV positive individuals (Kalichman et al., 2011; Weiser et al., 2012; Weiser, Tsai et al., 2012).

While it is much less studied, food security also impacts the psychosocial wellbeing of households. Household food insecurity is associated with several mental health conditions. (Chilton & Booth, 2007; Ivers & Cullen, 2011; McLaughlin et al., 2012). Laraia and colleagues (2006) found that food insecurity was associated with greater perceived stress, as well as higher levels of anxiety and depressive symptoms. In an exploration of gender differences, Carter and researchers reported that the association between food insecurity and depression was stronger for women compared to men (Carter, Kruse, Blakely, & Collings, 2011). Much of the research that has explored food insecurity and depression among women has focused on pregnant women or women who are raising small children in the household (Hromi-Fiedler, Bermudez-Millan, Segura-Perez, & Perez-Escamilla, 2011; Lent, Petrovic, Swanson, & Olson, 2009; Melchior et al., 2009).

A few studies have examined food insecurity among drug using individuals. Himmelgreen and researchers (1998) found that female drug users were more likely to experience food insecurity and have poor nutritional status compared to non-drug using women. Likewise, Strike and colleagues (2012) reported high levels of food insecurity among injection drug users. Further, food insecurity among drug users has been linked to risky sex and injection behaviors (Shannon et al., 2011; Strike et al., 2012). On a day-to-day basis, acquiring drugs to feed a drug addiction versus acquiring food for sustenance may represent two competing priorities for drug users (Romero-Daza, Himmelgreen, Pérez-Escamilla, Segura-Millán, & Singer, 1999; Strike et al., 2012).

While these studies demonstrate that drug users are prone to food insecurity, and depression has been consistently linked to drug use (Conner, Pinquart, & Duberstein, 2008; Falck, Wang, Carlson, Eddy, & Siegal, 2002; Montoya, Bell, Atkinson, Nagy, & Whitsett, 2002), it

is unclear if drug use exacerbates the physical and psychosocial consequences of food insecurity. In a sample of HIV-infected persons who use crack, Vogenthaler (2011) reported that food insufficiency, as measured by getting no or minimal food for two or more days in the past 30 days, was associated with depression.

The present study focuses on a sample of low-income women who are at risk for HIV. The purpose of the present study is two-fold. First, we examine food insecurity between women who use heroin and cocaine and women who do not. Then, we examine the association between depressive symptoms and food insecurity by drug use status. The data were stratified to determine if the relationship between food insecurity and depression varied between women who used heroin or cocaine and women who did not use drugs. We hypothesized that women who used heroin or cocaine had higher levels of food insecurity compared to women who did not use drugs.

Methods

Data for this study were collected during the 6-month follow-up assessment of the CHAT study, a social network oriented HIV prevention (Davey-Rothwell, Tobin, Yang, Sun, & Latkin, 2011). Two types of study participants (Index and Network) were enrolled in the study. Index participants were actively recruited into the study through street outreach, as well as posted advertisements. Inclusion criteria for index participants included: 1) female, 2) 18-55 years old, 3) did not inject drugs in the past 6 months, 4) self-reported sex with at least one male partner in the past 6 months, and one of the following 5a) current use of heroin or cocaine or 5b) sexual risk behavior in the past 6 months (i.e. two or more sex partners, recent STI diagnosis, or having a high-risk sex partner such as someone who injected drugs, smoked crack or was HIV positive). Network participants were referred to the study by index participants after the baseline visit. Since the a goal of the parent study was to assess diffusion of HIV risk reduction information/skills, inclusion criteria for network participants included: injected heroin or cocaine, being a sex partner of the index participant, or being a person the index participant felt comfortable talking to about HIV or STIs.

Data were collected at a community-based research clinic through face-to-face interviews. Part of the interview was administered by a trained interviewer and part was administered through Audio-Computer-Assisted Self-Interview. Participants were compensated \$35 for completion of each interview. The present study focuses on data collected during the 6-month follow-up assessment. Baseline data were collected from 567 women. The sample was comprised of 443 women who completed the 6-month follow-up assessment in May 2006 through June 2008. Prior to the start of the study, all protocols were approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Measures

Food Insecurity—Participants were asked four items to assess their level of food security. These measures were selected from the Core Food Security Module used by the USDA to assess food insecurity (Bickel, Price, Hamilton, & Cook, March, 2000). The items were:

1. Did you or other adults in your household cut the size of your meals or skip meals because there wasn't enough money for food?
2. At any time in the past 12 months, did you or other adults in your household not eat for a whole day because there wasn't enough money for food?
3. At any time in the past 12 months, were you ever hungry but didn't eat because you couldn't afford enough food?
4. In the past 12 months, did you lose weight because there wasn't enough food?

Each of the items were measured as 0=no and 1=yes. Responses were summed into a score of 0-4. Participants were coded as food insecure if they reported practicing any of the four behaviors. This measure has an acceptable level of internal consistency (Cronbach's alpha=0.76) in this sample.

Depressive symptoms—Depressive symptoms were measured through administration of the Centers for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977). The CES-D is a 20-item scale with 4 response categories including: 1) Rarely or none of the time, 2) Some or a little of the time, 3) Occasionally or a moderate amount of time, and 4) Most or all of the time. A summary score for all responses was computed. A cutpoint of 20 was used to indicate depressive symptoms, with “Depressed” defined as a score of 20 or higher vs. low symptomology or “Not Depressed” defined as a score of less than 20. This cutpoint has been used in other studies where depression levels of the sample are high (Costenbader, Astone, & Latkin, 2006). Internal consistency analysis in the present sample yield a Cronbach's alpha=0.86.

Drug Use—Participants were asked about their use of a variety of illicit drugs (any route of administration) in the past 6 months. Women who reported using heroin or cocaine in the past 6 months were classified as a drug user (DU). Women who did not report using heroin or cocaine in the past 6 months were coded as non-drug using (NDU).

Sociodemographics—We also examined several sociodemographic variables that may influence the relationship between sources of income and risk behavior. Participants were asked about their current employment status which was coded as employed (full or part-time) or not employed. Since the majority of participants were African American, race was coded as African American vs. other. Age was dichotomized based on the median. Homelessness was measured as a self-report of being homeless in the past 6 months. Total personal income was defined as total amount of income, regardless of source, in the past 30 days. This variable was dichotomized as less than \$500 versus \$500 or more. Having a main sex partner was assessed by the question “Do you currently have a main sex partner?” Participants were also asked if there were any children (biological and not biological) under the age of 18 in their household. Finally, self-reported HIV serostatus was assessed.

Data Analysis

Approximately 81% (n=447) of the baseline sample participated in a 6-month visit. Due to missing data on the depressive symptoms measures, 4 cases were removed from the dataset.

Thus, the sample for the present study is 443 women. Data were stratified based on participants' report of heroin or cocaine use in the past 6 months. Univariate analyses were assessed through frequencies and chi-square statistics. Chi-square analyses were conducted to determine differences between DU and NDU women. Since some participants were enrolled in an HIV prevention intervention, we examined the associations between being in the intervention with food insecurity and depression. There were no significant associations; also adding intervention status to the multivariate model did not affect the results. Thus, intervention status was not included in the final model. Since the sample was comprised of index and network participants, we also examined differences in food insecurity and depression by type of participant. There were no statistically significant differences. Thus, both index and network participants were included in the sample and client type was not added to the multivariate model.

Simple regression models were used to assess unadjusted relationships between depression and food security and other covariates. Two separate multivariate logistic regression models were computed, controlling for basic demographics (age, race, and income) as well as receiving food stamps.

Results

Sample Characteristics

As shown in Table 1, the majority of the sample was African American with a mean age of 42.7 years ($SD=7.7$). Participants were economically disadvantaged as shown by the low levels of employment and income as well as a high level of homelessness. Approximately 45% of the sample experienced high levels of depressive symptoms.

About one half of the sample (50.7%) reported using heroin or cocaine in the past 6 months. Drug using women (DU) were less likely to be employed at least part-time (30.7% vs. 15.5%, $p<0.001$) compared to women who did not use drugs (NDU). Also, DU women were more likely to be homeless (29.6% vs. 15.8%, $p=0.001$) and have depressive symptoms (52.0% vs. 39.0%, $p=0.007$).

Food Insecurity

Approximately 60% of the sample received food stamps and 28.9% of the total sample experienced food insecurity. While there were no differences in receiving food stamps, DU women were more likely to report being food insecure ($p<0.01$). About 36% ($n=81$) of DU women were food insecure while 22% ($n=47$) of NDU women reported being food insecure. Among both DU and NDU women, the most common food insecure behaviors practiced were cutting the size of meals and skipping meals. DU women were more likely to report engaging in each of the four food insecure behaviors compared to NDU women (differences in all behaviors was $p<0.01$).

After controlling for race, income, age, a significant association between food insecurity and depression existed for both DU and NDU women (Table 2). DU women who were food insecure were 2.71 times more likely to experience depression. The strength of this association was approximately double for NDU women [AOR: 5.90, 95% CI: 2.80, 12.45].

Among NDU women, receiving food stamps was also significantly associated with depression [AOR: 2.55, 95% CI: 1.35, 4.79]. There was no association between getting food stamps and depressive symptoms among DU women.

Discussion

In this sample of low-income women, approximately 29% of participants reported food insecurity in the past year. In addition, there was a significant association between food insecurity and depression among both groups of women.

This finding is consistent with previous research (Huddleston-Casas, Charnigo, & Simmons, 2009; Ivers & Cullen, 2011; Weaver & Hadley, 2009). Depression may reduce motivation to carry out daily activities, such as obtaining food or resources to get food. Further, food insecurities may lead to depression as a result of stress about finding sufficient food resources.

Women who used drugs were more likely to experience food insecurity, yet the relationship between food insecurity and depressive symptoms was two-fold for non-drug using women. There were several differences between DU women and NDU women which may account for this finding. NDU women were more likely to be employed and have higher income. If food insecurity occurs when women are trying to make ends meet and balancing numerous stressors, they may experience entrapment and vulnerability. A consequence of these feelings may be depression.

The mental health of women who used drugs may have been less impacted by food insecurity since drugs may be viewed as a greater priority as compared to food. In addition, research has shown that drug addiction inhibits appetite leading to the desire for fewer meals and sporadic eating (Neale, Nettleton, Pickering, & Fischer, 2012; Williamson et al., 1997). The physiological impact of drug use on suppressing appetite may reduce the effect of food insecurity on mental health.

There are some limitations of this study. First, all data were self-reported and participants may have been embarrassed or uncomfortable discussing their food insecurity and hence under reported it. In addition, we did not ask about the frequency of each of the food insecure behaviors. Finally, the data were cross-sectional. Regardless of the directionality of the association between food insecurity and depression, it is important to address the coexistence of these conditions. Further research is needed to longitudinally examine whether a reduction in food insecurity impacts level of depression and vice-versa.

Resources are needed to ensure that all households are food secure. Prior research has shown that Federal and state programs, such as the Supplemental Nutrition Assistance Program (SNAP), have led to decreased hunger and food insecurity (Nord & Golla, 2009; Nord & Prell, 2011; Ratcliffe & McKernan, 2010). Approximately 60% of participants reported getting food stamps in the past 30 days. The low-income level of study participants indicates that many participants were eligible for SNAP and other benefits yet they did not access these resources. Greater outreach and reduced barriers may enable greater reach for SNAP and consequently lower levels of food insecurity. For those women who are food insecure

but receive food stamps, research should examine individual, community, and structural level factors that may prevent food insecurity.

While food assistance programs are very useful, they may not be enough to decrease food insecurity and its consequences among certain populations. As shown by Eicher-Miller and colleagues (2009), the integration of nutrition education with benefits, like food stamps, had a stronger impact on food insecurity. In an analysis of two national, longitudinal datasets, Kim and Frongillo (2007) found that among food insecure elderly individuals, participants in food assistance programs were less likely to be depressed. Interestingly, in our study, NDU women who received food stamps were twice as likely to experience depression. This association may have existed because of lack of resources within their social network or due to stigma related to applying for food assistance. Women who did not use drugs were more stable as demonstrated by higher rates of employment and lower rates of homelessness. Getting food stamps may have led to feelings of incompetence to provide basic resources for themselves.

The study results also suggest that it is critical to integrate mental health, food assistance, and other services. Just as medical providers and drug treatment specialists assess the mental health of its patients, they should also assess food insecurity. Identifying food insecure behaviors and reasons for those behaviors will aid individuals in the recovery process. Another strategy to support the overall health of food insecure individuals is to include a brief depression screening in the application process for food benefits. If an individual shows depressive symptoms, mental health resources should be provided. In addition, food pantries and soup kitchens should consider providing mental health resources or screening.

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Table 1

Sample Characteristics of Drug Using (DU) and Non-Drug Using (NDU) Women.

Characteristic	N (%) (n=443)	DU women (n=225)	NDU women (n=218)	Test statistic	p-value
Age (Mean(SD)	42.7 (7.74)	43.9 (6.0)	41.5 (9.0)	3.4	p=0.001
African American	435 (97.3)	220 (97.3)	215 (97.3)	0.002	ns
Income in the past 30 days (less than \$500)	195 (43.6)	112 (49.6)	83 (37.6)	6.5	p=0.011
Employed at least part-time	102 (22.8)	35 (15.5)	67 (30.7)	14.6	p<0.001
Homeless in the past 6 m	101 (22.8)	67 (29.6)	35 (15.8)	12.1	p=0.001
Self-reported HIV positive	56 (12.5)	28 (12.4)	28 (12.7)	0.01	ns
Currently has a main sex partner	325 (3.2)	166 (73.5)	159 (72.9)	0.015	ns
Had children under 18 years old living in household	123 (27.5)	56 (24.8)	67 (30.7)	1.9	ns
Depressive Symptoms (CESD 20)	202 (45.6)	117 (52.0)	85 (39.0)	7.5	p=0.01

Table 2

Multivariate Results of The Relationship Between Food Insecurity and Depression by Drug Use.

Characteristic	DU women (n=225)		NDU women (n=218)	
	Unadjusted Odds Ratio [95% C.I.]	Adjusted Odds Ratio [95% C.I.]	Unadjusted Odds Ratio [95% C.I.]	Adjusted Odds Ratio [95% C.I.]
Food Insecure	2.91 [1.63, 5.17]*	2.71 [1.51, 4.88]*	5.39 [2.66, 10.9]*	5.90 [2.80, 12.45]*
Received food stamps in past 30 days	0.88 [0.51, 1.50]	0.85 [0.48, 1.50]	2.24 [1.26, 3.96]*	2.55 [1.35, 4.79]*
Race	0.53 [0.09, 2.97]	0.61 [0.10, 3.73]	0.31 [0.05, 1.72]	0.33 [0.05, 2.08]
Age	1.02 [0.97, 1.06]	1.01 [0.99, 1.06]	1.00 [0.97, 1.03]	1.01 [0.98, 1.05]
Income (less than \$500) in past 30 days	0.62 [0.36, 1.04] ⁺	0.61 [0.38, 1.17]	0.68 [0.39, 1.20]	0.99 [0.53, 1.85]

Note:

⁺: p<0.10,

*: p<0.05