Perceived Barriers to Healthy Eating and Physical Activity Among Participants in a Workplace Obesity Intervention

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Objective: To characterize barriers to healthy eating (BHE) and physical activity (BPA) among participants in a workplace weight management intervention. **Methods:** Steps to health participants completed a questionnaire to ascertain barriers to physical activity and healthy eating faced. Exploratory factor analysis was used to determine the factor structure for BPA and BHE. The relationships of these factors with accelerometer data and dietary behaviors were assessed using linear regression. **Results:** Barriers to physical activity included time constraints and lack of interest and motivation, and to healthy eating, lack of self-control and convenience, and lack of access to healthy foods. Higher BHE correlated with higher sugary beverage intake but not fruit and vegetable and fat intake. **Conclusions:** To improve their effectiveness, workplace weight management programs should consider addressing and reducing barriers to healthy eating and physical activity.

For obese adults, positive behavior changes such as reducing fat intake, increasing vegetable consumption, and increasing physical activity can have significant health benefits.[1,2] Promotion of healthy eating and physical activity are the key components of most weight loss interventions. Despite this, interventions that target these behaviors are often unsuccessful, and any changes that are initially made are often difficult to maintain.[3,4] One likely explanation for this lack of success is that interventions do not target and overcome the unique barriers obese individuals face. Thus, it is important to understand such behavior change barriers, to better inform future obesity interventions.

Perceived barriers are posited to hinder health behavior change. According to the Health Belief Model (HBM), such barriers are the potential negative aspects of a health action that can impede partaking in the recommended behavior.[5] Of all constructs in the HBM, perceived barriers have been found to be the most significant in determining behavior change.[6] A wide range of perceived barriers to both healthy eating (BHE) and to physical activity (BPA) have been reported: lack of time,[7–10] disliking the taste of healthy food,[11–13] cost of healthy food,[12] lack of willpower,[14] and lack of knowledge.[9,10] Correspondingly, commonly reported BPA include: lack of time,[7,9,12,15,16] lack of social support,[7,9,17] lack of motivation,[9,16] and lack of discipline.[15] Although some earlier studies have focused on obese individuals, most studies to date have focused on the general population and those may not fully have captured barriers unique to obese individuals, especially within the workplace.

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Funding: This research was supported by a grant from the Centers for Disease Control (CDC), National Institute for Occupational Safety and Health (R01 OH009468).

The authors have no conflicts of interest to report.

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DOI: 10.1097/JOM.0000000000001092

In addition to individual perceived barriers, there are a number of interrelated determinants of the obesity epidemic at the societal level that influence an individual's weight status, including health policies, advertising, the work environment, the food system, the built environment, the school system, and the health care system.[18] Although these are critical factors to understand, the primary objective of the current study was to characterize BHE and BPA as perceived by obese individuals participating in a workplace weight management intervention. We administered questionnaires to assess perceived BHE and BPA experienced by participants while part of the intervention. First, we analyzed the factor structure of the BHE and BPA scales; and developed descriptive summaries of perceived barriers and their distribution by basic demographic factors. Finally, to evaluate the importance of these barriers, we examined the relationships between the barrier factor constructs and corresponding diet and exercise behaviors.

METHODS

Study Design

Data for these analyses were collected as part of the steps to health (STH) study, a randomized controlled trial to evaluate the effect of two employee weight management programs at the second largest employer in North Carolina, United States. Details about the design, rationale, and outcomes of this study can be found in previously published work.[19,20]

Additional data for these analyses were collected after the completion of the main STH study, through the steps to health follow-up study—a retrospective study to investigate how employee weight management programs could be improved for future participants. In the follow-up study, all participants from the STH study who had agreed to be contacted for further research were asked to complete a brief questionnaire. Those who completed this questionnaire were compensated $10 and were entered into a drawing to win a fitbit fitness tracker. All research activities were approved by the Duke University Health Center Institutional Review Board.

Participants and Recruitment

The target population for the original STH study was obese (BMI is greater than or equal to 30) employees at Duke University and Medical Center, Durham NC. Employees are asked to participate annually in employee health checks, during which their weight and height are measured. From January 2011 until July 2012, employees with measured BMI are greater than or equal to 30 during a health check were informed about the study and invited to participate. A total of 550 participants were recruited for the original study.

Of these participants, 323 indicated that they were willing to be part of a repository from which they could be re-contacted for further research, and were invited to take part in the STH follow-up study. An email survey was distributed via Qualtrics to each member of the repository, inviting them to participate in the survey. After 2 weeks, those who had not yet responded were sent one reminder email. Finally, 2 weeks after the final email, a paper copy of the survey was sent to the last known address of those who had not yet responded. In total, 124 (38% of the 323 eligible) individuals

participated in the follow-up survey, and they are the focus of the current analyses.

Measures

Demographic information on age, race, and sex were collected in the original STH study. In the follow-up survey, additional socio-demographic data were collected including: education, whether a spouse or partner was living at home, and the number of children living at home.

BHE and BPA were measured among the follow-up study participants. BPA were assessed using a 21-item scale developed by Rogers et al[21] and BHE were assessed using a similar 19-item scale for healthy eating developed by Ventura et al.[15] For both scales, participants were asked to rate a list of barriers on how often these interfered with exercise or physical activity while the participants were in the STH weight management program. Responses were on a 5-point Likert scale, (1 = never, 2 = rarely, 3 = sometimes, 4 = often, or 5 = very often). Previous studies have calculated mean scores for each of the scales.[15,21] In this study, we chose to examine the factor structure of the scales and report results by the underlying constructs identified in the factor analysis.

During the original STH study, participants were asked to complete a questionnaire that included dietary behaviors often related to obesity. Vegetable intake was measured using the National Cancer Institute (NCI) fruit and vegetable screener.[22] Participants were also asked to recall frequency and quantity of food intake in the past month, and responses were scored to calculate servings of vegetables per day. Although this is a brief measure, studies have shown that results are highly correlated with true intake.[23]

The percentage of energy intake derived from fat was determined using the NCI fat screener, a scale comprised of three questions to assess eating habits over the past year.[24] The scale has been widely used in obesity research, and has been validated for use in adult populations.[25,26]

Additional questions were asked to estimate number and quantity of sodas and other sugar sweetened beverages consumed. These estimates were used to calculate total ounces of sugar sweetened beverages consumed per day.

Time spent doing physical activity was measured using accelerometers.[27] Participants were asked to wear a belted Actical accelerometer (model #198–0302, Mini-Mitter Co. Inc., Bend, OR) during waking hours 7 consecutive days. Mean number of minutes of sedentary, light, and moderate to vigorous activity were derived from the accelerometer data, calculated as recommended by the US Centers for Disease Control and Prevention (CDC).[28] Further analysis methods have described previously.[19]

Data Analysis

All analyses were performed using SAS version 9.4 (2012; SAS Institute Inc.). Since we asked about barriers experienced during the study period, age when first enrolled in the STH study was used for all analyses. Furthermore, all health measures and behaviors presented here were measured at baseline of the STH study. As complete data were important in this analysis, we imputed missing data from the BHE and BPA scales using the maximum likelihood method with EM Algorithm (PROC MI in SAS).[29] One response was missing from BPA data (0.03% missing) and nine respondents were missing from the BHE data (0.7% missing).

We then determined the factor structure of the BHE and BPA scales via exploratory factor analysis (EFA). Principal axis factoring (PAF) with oblique Promax rotation was employed separately on each scale, as recommended for non-normal, ordinal data.[30] Solutions for three, four, five, and six factors were each examined for both BHE and BPA, using Promax rotations of the factor loading matrix. Factors were retained based on visual inspection of the Scree plot,[31] and a factor loading cutoff of 0.40 was used to determine factor grouping. The four factor solution, which explained 57% of the variance for the BHE scale and 61% for the BPA scale, was preferred for both scales because of the 'leveling off' of eigen values on the Scree plot after four factors; and the difficulty in interpreting the fifth factor and subsequent factors. Factors were named according to underlying constructs of the loaded items. Cronbach α was calculated for each factor to measure internal consistency. Factor scores were calculated by taking the mean score of relevant items. This method is recommended when doing exploratory analyses and allows preservation of variability in the data.[32,33]

Mean scores for each factor were calculated to determine which barriers were most common among participants. Linear regression analysis was used to evaluate relationships of BPA and BHE factor scores with respective behaviors related to physical activity (ie, minutes of sedentary, light, and moderate to vigorous activity per hour) and healthy eating (ie, number of fruits and vegetables per day, percent of energy derived from fat, and ounces of sugar sweetened beverages per day).

RESULTS

Participant characteristics are presented in Table 1. Participants had a mean age of 45 years (standard deviation [SD] = 9.0), 93% were women and 50% were black. These distributions were slightly different from those reported in the original study, in which 83% were women and 53% were black, however the average age for participants was the same for the original study and this follow-up study of barriers. Similarly, those who did not complete the follow-up survey had a mean age of 45 years, 80% were women and 54% were black.

The mean BMI was 37.7 (range 29.5–66.1), corresponding to obesity class II as defined by the National Institutes of Health.[34] Participants consumed an average of 2.9 (SD = 2.4) servings of fruits and vegetables per day, well below the US government

TABLE 1. Participant Characteristics ($n = 124$)

Personal	***N* (%)**
Gender	
Male	9 (7.3)
Female	115 (92.7)
Race	
White	54 (43.6)
Black	61 (49.9)
Other	9 (6.5)
Age	
<40	37 (29.8)
40–50	48 (38.7)
>50	39 (31.5)
Education	
No college degree	43 (34.7)
Associate's or Bachelor's degree	52 (41.9)
Graduate degree	29 (23.4)
Health Measures and Behaviors	**Mean (SD)**
BMI	37.7 (6.7)
Diet	
Energy from fat (% of total)	33.2 (5.8)
Fruits and vegetables (servings/d)	2.9 (2.4)
Sugar sweetened beverages (oz/d)	16.3 (26.9)
Activity	
Sedentary activity (min/hr)	47.3 (3.2)
Light activity (min/hr)	9.6 (3.2)
Moderate or vigorous activity (min/hr)	0.89 (0.74)

BMI, body mass index; SD, standard deviation.

TABLE 2. Factors and Factor Loadings of Barriers to Physical Activity Scale*

		Factor Loadings			
	Mean (SD)	Factor 1	Factor 2	Factor 3	Factor 4
Q10. Exercise not a priority	3.0 (1.0)	**0.84**	−0.08	0.07	−0.05
Q11. Exercise was boring	2.5 (1.1)	**0.78**	0.31	−0.19	−0.15
Q5. Lack of interest in exercise	2.9 (1.0)	**0.76**	0.18	−0.11	0.02
Q2. Lack of self-discipline	3.5 (1.2)	**0.74**	−0.23	0.20	0.12
Q7. Exercise not in routine	3.2 (1.1)	**0.64**	0.04	0.31	−0.12
Q4. Procrastination	3.3 (1.0)	**0.58**	−0.11	0.24	0.13
Q9. Lack of enjoyment from exercise	2.7 (1.1)	**0.53**	0.37	−0.09	−0.05
Q3. Fatigue (or lack of energy)	3.3 (0.9)	**0.52**	−0.18	0.33	0.16
Q12. Lack of company	2.7 (1.2)	**0.49**	0.39	−0.19	0.08
Q16. Cost of exercising (eg, gym dues, equipment)	2.8 (1.4)	0.03	**0.84**	0.10	−0.12
Q18. No facilities or space to exercise	2.1 (1.1)	−0.03	**0.81**	0.18	−0.07
Q15. Lack of equipment	2.3 (1.1)	−0.10	**0.81**	0.15	−0.01
Q17. Lack of skills	2.2 (1.0)	0.10	**0.59**	−0.03	0.37
Q21. Lack of knowledgeable exercise staff	1.8 (0.9)	0.01	**0.59**	−0.11	0.33
Q6. Family responsibilities	3.3 (1.2)	−0.06	0.10	**0.80**	−0.12
Q1. Lack of time	3.4 (1.1)	0.22	0.02	**0.71**	−0.05
Q13. Inconvenient exercise schedule	3.1 (1.1)	0.18	0.36	**0.58**	0.03
Q14. Bad weather	2.5 (0.9)	−0.17	0.31	0.42	**0.41**
Q19. Fear of injury	2.0 (1.1)	−0.01	0.14	−0.03	**0.76**
Q20. Feeling nauseated	1.5 (0.8)	−0.08	−0.01	−0.16	**0.73**
Q8. Pain or discomfort	2.7 (1.2)	0.17	−0.11	0.08	**0.71**
Cronbach α	NA	0.88	0.85	0.73	0.69

NA, not applicable; SD, standard deviation.
*Bold factor loadings indicate the factor score in which the item was included.

recommendation of five to nine servings per day.[35] Intake of sugar sweetened beverages was high with an average of 16.3 oz consumed per day, (SD = 26.9). Participants spent most of their time sedentary, on average 47.3 minutes per hour (SD = 3.2) and participated in much less (mean 0.89 minutes per hour, SD = 0.74) than the amount of time for moderate or vigorous-intensity activity recommended (2 hours and 30 minutes per week) by the US Department of Health and Human Services.[36]

Of the items in the BPA scale, lack of self-discipline and lack of time were most commonly endorsed. Exploratory factor analysis of the BPA scale yielded four factors. Mean scores and factor loadings of each item are shown in Table 2. Item 14 loaded on two factors, but was included in factor 4 as its meaning corresponded with the factor 4 items. Factors were named based on their commonality, possibly underlying constructs: 1. Lack of interest and motivation, 2. Lack of accessibility, 3. Time constraints, 4. Physical discomfort.

The BHE item ''Holidays and special occasions were a problem,'' was the item most strongly agreed with, followed by: ''I felt like eating whatever I want,'' ''I ate a lot of meals away from home,'' and ''Healthier foods were too expensive.'' Exploratory factor analysis of the BHE scale yielded four factors. Item 17, ''I did not like the taste of fruits and vegetables,'' was removed due to its low factor loading on factor 3 (0.29) and the lack of a clear association with the other constructs. The analysis was performed again without this question; these results and mean scores are shown in Table 3. Item 5 loaded on both factors 1 and 2, but was included in factor 1 because of the higher factor loading and because it's meaning corresponded best with other items in the factor. The final factors included: 1. Lack of self-control and convenience, 2. Lack of access to healthy foods, 3. Negative attitude towards healthy foods, 4. Lack of knowledge and support.

Mean factor scores were calculated for each factor (Table 4). The more common BPA were time constraints and lack of interest and motivation. The more common BHAs were lack of self-control and convenience, and lack of access to healthy foods.

For the BPA, education was negatively associated with accessibility ($\beta = -0.21$, $P = 0.05$). Furthermore, white participants were more likely to express lack of interest and motivation ($\beta = 0.41$, $P < 0.001$) and time constraints ($\beta = 0.49$, $P < 0.001$).

Regarding BHE education was negatively associated with lack of access to healthy foods ($\beta = -0.20$, $P = 0.04$) and lack of knowledge and support ($\beta = -0.24$, $P = 0.01$). Age was negatively associated with lack of self-control and convenience ($\beta = -0.02$, $P = 0.02$). Lastly, black participants were more likely to report lack of access to healthy foods ($\beta = -0.37$, $P = 0.02$). No significant association was observed between the barriers and BMI.

Two BPA factors, lack of interest and lack of motivation, were correlated with decreased light activity and increased sedentary activity (Table 5). Lack of accessibility showed the same associations, as well as decreased moderate to vigorous activity. Physical discomfort was also related to decreased moderate to vigorous activity.

Finally, correlation between BHE factors and diet behaviors (Table 6) were assessed. The barriers showed little correlation with fruit and vegetable and fat intake, but all barriers were correlated with increased consumption of sugar sweetened beverages.

DISCUSSION

There are important barriers to physical activity and healthy eating for obese participants in a workplace weight loss intervention program, and some of these barriers differ significantly by age, race, and education. To our knowledge, this is the first study to examine both BPA and BHE in an obese workplace population.

Time constraints, and lack of interest and motivation, were found to be the main BPA, while lack of self-control and convenience, and lack of access to healthy foods were the main BHE. These common barriers are consistent with those found previous literature related to the general population. Lack of time is the most frequently reported BPA in developed countries.[37] Even a study among men and women in seven Arab countries found both lack of time and lack

TABLE 3. Factors and Factor Loadings of Barriers to Healthy Eating Scale*

		Factor Loadings			
	Mean (SD)	Factor 1	Factor 2	Factor 3	Factor 4
Q3. High fat foods tasted better	3.1 (1.0)	**0.77**	0.01	0.01	0.09
Q2. I felt like eating whatever I want	3.2 (0.8)	**0.76**	−0.16	0.17	0.00
Q4. I ate a lot of meals away from home	3.2 (1.0)	**0.68**	0.21	−0.12	−0.09
Q1. Holidays and special occasions were a problem	3.5 (1.0)	**0.63**	−0.20	−0.13	0.16
Q5. It was easier to grab another type of snack and eat it in my car	2.8 (1.1)	**0.47**	0.43	0.02	−0.24
Q6. It took too much planning to eat a healthier diet	2.9 (1.0)	**0.46**	0.29	0.27	−0.11
Q9. There were no healthy food options at sporting events	2.6 (1.3)	−0.10	**0.85**	0.01	−0.04
Q14. There were no healthier foods in vending machines	2.8 (1.3)	−0.20	**0.80**	0.00	0.12
Q7. High fat foods are a traditional part of my culture	2.7 (1.1)	0.10	**0.67**	0.04	0.15
Q8. Healthier foods were too expensive	3.2 (1.2)	0.26	**0.44**	−0.09	0.20
Q10. I couldn't keep track of what I need to eat	2.6 (1.1)	0.06	**0.41**	0.31	0.09
Q11. Fruits and vegetables didn't fill me up	2.8 (1.1)	−0.07	0.06	**0.88**	−0.20
Q15. I did not like the taste of healthier foods	2.3 (1.1)	0.05	−0.02	**0.76**	0.08
Q12. Fruits and vegetables took too long to prepare	2.3 (1.1)	0.39	−0.01	**0.39**	0.11
Q18. I did not know how to cook vegetables	1.6 (1.0)	0.05	−0.14	0.21	**0.78**
Q19. I did not know where to find low fat foods	1.7 (0.9)	−0.02	0.27	0.04	**0.74**
Q16. My family did not support me for eating more healthfully	2.0 (1.0)	0.07	0.17	−0.27	**0.65**
Q13. I did not know how to cook healthier meals	2.1 (1.0)	−0.09	−0.01	0.55	**0.48**
Cronbach α	NA	0.78	0.76	0.70	0.74

NA, not applicable; SD, standard deviation.
*Bold factor loadings indicate the factor score in which the item was included.

of motivation to be very commonly reported barriers to physical activity.[9] While many of these barriers are reported by and are common among the general population, both our study and another study specifically focusing on obese individuals, found that lack of self-control were most commonly reported. This factor may be more important among obese individuals than in the general population.[10] The sense of lack of control among obese individuals is important to consider when designing a weight loss or maintenance intervention. Population based studies have also found lack of access to healthy foods to be a commonly reported barrier to healthy eating in American,[38] Arab,[9] and Canadian[39] populations.

Results from the exploratory factor analysis show acceptable reliability for all eight barrier factors identified. While BPA factors represent readily meaningful constructs, BHE factors were less intuitive. Specifically, factor 1 seems to contain two separate ideas, lack of self-control and lack of convenience. One explanation may be that these two factors work in tandem; that is, if someone lacks self-control and at the same time do not have convenient access to healthy foods, they are more likely to make unhealthy choices. All BPA and BHE identified in this study are comparable to perceived barriers in other populations, adding validity to the measurement.[9,10,15,37,40,41] Further, nearly all barrier factors were inversely correlated with one or more positive health behaviors, as expected.

The regression models for physical activity and BPA factors demonstrated that a one-unit increase in the lack of accessibility barrier agreement corresponded to an increase of 0.98 minutes/hour of sedentary time, and a decrease of both light (0.69 minutes/hour) and moderate to vigorous (0.21 minutes/hour) activity. To put these results in perspective, it is important to note that the overall amount of light and moderate to vigorous activity was very limited in the sample, with an average of 9.6 (SD = 3.2) and 0.9 (SD = 0.74) minutes per hour, respectively. Similar results are seen with a one-unit increase of the lack of interest and motivation barrier. Time constraints were not significantly related to activity level, and physical discomfort was only significantly correlated with a decrease in moderate to vigorous activity. It is plausible that physical pain may affect one's ability to exercise vigorously, while still allowing light activity. These results provide insight into the barriers for obese individuals in participating in various levels of activity. While increasing interest and motivation could lead to an increase in light activity, interventions should target increased accessibility and reducing physical discomfort in order to encourage more moderate to vigorous activity in weight loss interventions.

TABLE 4. Mean Factor Scores

Barrier Type	Factor	Mean (SD)
Physical activity	1. Lack of interest and motivation	3.0 (0.8)
	2. Lack of accessibility	2.2 (0.9)
	3. Time constraints	3.3 (0.9)
	4. Physical discomfort	2.2 (0.7)
Healthy eating	1. Lack of self-control and convenience	3.1 (0.7)
	2. Lack of access to healthy foods	2.8 (0.8)
	3. Negative attitude towards healthy foods	2.5 (0.9)
	4. Lack of knowledge and support	1.9 (0.7)

SD, standard deviation.

TABLE 5. Bivariate Relationship Between BPA Factors and Physical Activity Level

	Activity Level					
	Sedentary		Light		Moderate to Vigorous	
BPA Factors	Estimate	*P*	Estimate	*P*	Estimate	*P*
1. Lack of interest and motivation	1.13	**0.006**	−1.08	**0.008**	−0.1	0.31
2. Lack of accessibility	0.98	**0.004**	−0.69	**0.04**	−0.21	**0.008**
3. Time constraints	0.42	0.22	−0.25	0.45	−0.06	0.41
4. Physical discomfort	0.54	0.21	−0.56	0.19	−0.22	**0.02**

Bold text indicates $P < 0.05$. BPA, barriers to physical activity.

Similarly, our results suggest that higher endorsement of BHE, including lack of self-control and convenience, lack of access to healthy foods, and negative attitude toward healthy foods correspond with significantly higher sugar sweetened beverage consumption. No barriers were significantly correlated with percent of energy from fat or servings of fruits and vegetables per day. Since all participants were obese and consumed similarly high fat and low vegetable diets, lack of variation in diet composition limits the ability to assess this relationship. Further, these values were calculated based on self-reported eating habits, which may be inaccurate.

Obesity can be prevented or reduced through regular physical activity and healthy eating. Most Americans spend much of their time at work, creating an opportunity for employers to influence physical activity and healthy eating through workplace interventions. However, interventions to promote behavioral change often have limited success.[3,4] Understanding barriers to behavior change as it relates to physical activity and healthy eating, which likely influence intervention effectiveness, is a needed area of continued research.

While the participants reported high levels of BHE and BPA overall, there was significant variation in barriers by age, education, and race. Thus, to be effective, interventions also need to be sensitive to the differential importance of barriers to physical activity and healthy eating in different groups of individuals.

This study has some limitations. Generalizability is somewhat limited in that the response rate was relatively low compared with that in the main study. Lack of participation by men, both in the main study and in this follow up study, is also limitation. However, there was good representation across age groups, racial groups, and education levels.

The workplace can be an important setting for advancing the safety, health, and well-being of workers. There is growing evidence suggesting that occupational safety and health protection program activities integrated with health promotion program activities are more effective for safeguarding worker safety, health, and well-being than either of these programmatic activities on their own. This type of integration is promoted by the National Institute for Occupational Safety and Health (NIOSH) Total Worker Health™ initiative.[42]

While many workplace interventions target individuals, organizational and environmental changes in the workplace are also critical for achieving positive impact. For example, time constraints, the most strongly supported BPA, could be addressed by providing opportunities and resources for physical activity while at work. This is especially important for those who work long hours and for those who work second and third shift hours. One study showed that encouraging employees to take the stairs can increase stair usage, and, encouragingly, that such stair usage can have greater impact in overweight employees.[43] Other studies suggest that encouraging workplace walking groups also can have significant health benefits.[44,45]

While it is clear that obesity is a complex problem with many contextual and societal factors contributing, the workplace is one place where Americans spend a large proportion of their waking hours, and it can be an important setting for promoting and supporting healthy eating. Lack of access to healthy foods, the greatest BHE identified, as well as the convenience of unhealthy food, could be addressed via promotion of healthy options at work. One study found that reducing prices on healthy foods in vending machines can increase sales of these foods,[46] while increasing access to healthy foods can lead to increased fruit and vegetable consumption.[45]

IMPLICATIONS FOR RESEARCH AND PRACTICE

There are numerous important barriers to physical activity and healthy eating among obese working individuals that may limit the acceptance, uptake and effectiveness of workplace weight management interventions. For physical activity, the most

TABLE 6. Bivariate Relationship Between BHE Factors and Diet Factors

	Diet Factors					
	Energy from Fat (% of total)		Fruits and Vegetables (Servings/d)		Sugar Sweetened Beverages (oz/d)	
BHE Factors	Estimate	*P*	Estimate	*P*	Estimate	*P*
1. Lack of self-control and convenience	0.89	0.27	−0.53	0.09	9.52	**0.008**
2. Lack of access to healthy foods	0.58	0.36	0.02	0.94	5.73	**0.04**
3. Aversion to healthy foods	0.21	0.75	−0.2	0.43	6.48	**0.03**
4. Lack of knowledge and support	1.11	0.13	0.01	0.97	5.91	0.08

Bold text indicates $P < 0.05$. BHE, barriers to healthy eating.

commonly reported barriers are time constraints and lack of interest and motivation; for healthy eating the most common are lack of self-control and convenience, and lack of access to healthy foods. It is important that future intervention programs, as well as their evaluation, not only address these and other barriers to be successful—they should be sensitive to the fact that the relative importance of these barriers may vary across groups of obese workers.

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