# Obesity in the Workplace: a Systematic Review of Barriers and Facilitators to Healthy Lifestyles

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## Abstract

Workplace health promotion has become a major focus for many organizations, but for these efforts to be effective, they need to recognize that there are barriers to individuals choosing and participating in healthy nutrition and physical activity behavior. This systematic review seeks to identify, classify, and discuss several of these barriers, as well as facilitators, integrate important theories that explain their effects on behavior outcomes and provide scientific evidence for their existence and importance in employee health behavior choices. Our search identified 14 articles that sought specifically to identify barriers and/or facilitators to healthy choices in the workplace. An analysis of these barriers and facilitators determined that they could be classified into one of four categories: physical, personal, social, and organizational factors. Suggestions for best practices for utilizing this information for health promotion and future research avenues are also discussed.

**Keywords** Obesity · Barriers · Facilitators · Health · Exercise · Nutrition

Obesity rates have steadily grown in the United States with approximately 69% of the U.S. population overweight or obese (National Institute for Health 2017; Ogden et al. 2012). The global prevalence of those classified as overweight or obese has increased by 27.5% for adults and an alarming 47.1% for children since 1980 (Ng et al. 2014). Obese employees average two times the workers' compensation claims, versus those with healthier body weights (Borak 2011). Additionally, obese workers have higher rates of absenteeism and presenteeism in the workplace (Borak 2011). Across 183 countries since 1980, there have been no significant decreases in obesity, suggesting

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that the obesity epidemic will not only continue but potentially get worse (Ng et al. 2014). Furthermore, obesity is linked to cardiovascular disease (Lavie et al. 2009), diabetes (Mokdad et al. 2003) and cancer (Wolin et al. 2010), which are three of the most common causes of death in the United States (Mokdad et al. 2004). Meanwhile, many people are not making healthy nutritional decisions or taking part in enough physical activity, partially explaining the obesity problem while also potentially exacerbating it. One large-scale study in Australia found that participants spent nearly 4 times as many hours per week on sedentary behaviors than they did on physical activity (39.3 for men and 34.7 for women, compared to 10.0 and 7.98. respectively (Salmon et al. 2003). Meanwhile, only 8.2% of adults in Australia are getting an adequate intake of fruits and vegetables (American Bureau of Statistics 2013), and only about 14% and 12.5% of Americans meet the minimum servings guidelines for fruits and vegetables, respectively (Usual Dietary Intakes 2013).

Previous research has demonstrated that there are numerous barriers and facilitators to making healthy decisions in the workplace (e.g., Blackford et al. 2013; Jaffee et al. 1999). In this paper, we conducted a systematic review of studies that specifically sought to identify common barriers and facilitators of healthy decisions in the workplace with the aim to create a complete taxonomy of the barriers and facilitators commonly mentioned by workers, particularly through the framework of the Theory of Planned Behavior (e.g., Ajzen 1991; Conner et al. 2002). We further seek to provide information on the important relationship these factors have on organizational and personal variables based on the current literature, and we prescribe potential uses for this information in practice and future research. As far as we can tell, this is the first attempt to collect and classify these factors, which have previously only been examined in single sample/source studies scattered across several different disciplines (e.g., Apostolopoulos et al. 2012; Mazzola et al. 2017). In the following section, we briefly review some of the key theoretical perspectives regarding health-related choices, but the theories and mechanisms behind the effects of these barriers and facilitators are further discussed in the sections referring to each specific barriers and facilitators identified.

## Theory behind Health Behavior

Either through childhood or occurring later in adulthood, reaching obesity does not usually happen quickly and can be a long-term process, in part, resulting from a series of decisions regarding one's health, such as daily decisions on what to eat and/or whether to participate in or physical activity (Marks et al. 2018). For a more comprehensive explanation of the biological and psychological theories regarding obesity specifically, we recommend Wilborn et al. (2005) or Markey et al. (2016), just to name a few. This particular review will focus on the role various workplace factors play in daily health decisions that may ultimately lead to obesity while tying in several relevant theories that we feel are most pertinent to that discussion.

Therefore, for the purpose of this review, a healthy lifestyle will be defined as eating a balanced and nutritious diet, taking part in regular physical activity, and abstaining from/limiting alcohol, tobacco, and drug use, which is congruent with the World Health Organization's definition of a healthy lifestyle (1999), with particular emphasis on the

first two factors. This is congruent with both the Energy Surfeit (Marks et al. 2018) and Inactivity Theories of obesity (Hall et al. 2011). The former posits that weight gain is a product of calories consumed and calories burned by the individual, while the latter discusses how physical activity can aid in weight loss/management while inactivity contributes to odds of becoming obese. It is important that organizations realize, however, that proper health promotion must include paying attention to the needs of those who need to lose, maintain, and/or gain weight to reach "healthy" status, to prevent the exclusion of one group's health for the other (although admittedly, the former is likely most important in the short term to lowering obesity rates). In any case, for obesity rates to decrease, people *will necessarily* need to make healthy decisions, which organizations are excellently poised to promote and facilitate.

Due to its potential application in workplace settings, we specifically focus on the Social Ecological Theory here (and later the Theory of Planned Behavior; Ajzen 1991) to create a context for the current discussion on how organizations can hinder or help an employee's effort to live a healthy lifestyle. In general, individuals who consume more calories than they expend via physical activity tend to gain weight, typically in the form of fat and are more likely to become obese (Romieu et al. 2017). The Social Ecological model suggests that although individual habits play a role in unhealthy behavior, the physical and environmental conditions also strongly affect the potential for unhealthy behavior (Stokols 1996). Moreover, this theory states that promotions to improve health behaviors should focus not only on behavioral change but on restructuring the environment and understanding the degree to which a person's needs and environmental resources fit. For example, research shows that both the presence of stressors and an effort-reward imbalance at work (a perception that one's rewards are not commensurate with the effort put in; Siegrist 2002) are related to weight gain (Berset et al. 2011).

Moreover, Audrey and Procter (2015) further pressed the socio-ecological model by pushing the importance of change at the intrapersonal, interpersonal, institutional, community, and policy levels. For example, they indicated that workplace policies that support the walking environment include developing pavement improvements, pedestrian crossings, and traffic calming. Certainly, there are other factors, such as genetics and specific disorders (Romieu et al. 2017), but overall an individual's weight is significantly influenced by culture, community, stress, and security induced by their environment (Stokols 1996).

In the context of this paper, this would mean working to remove potential barriers and enhance the availability of facilitators to healthy eating and exercise, while realizing that different individuals will experience and perceive these differently. Within the context of this review, barriers are considered factors/characteristics that prevent or inhibit an individual from making a healthy decision in the workplace, while facilitators are those that promote or facilitate an individual to make such decisions. It is worth noting that while many factors are distinctly either a barrier *or* a facilitator (not both), some factors/characteristics of the environment could be categorized as both a barrier *and* a facilitator, depending on whether it is present or absent in the workplace. For instance, the absence of healthy food options may act as a barrier, while the presence of healthy food options may act as a facilitator. Throughout the paper, we will make note of when a specific factor could be categorized as both a facilitator and a barrier and discuss them together. However, those factors will be categorized in the tables as barriers and facilitators separately since the original studies identified them as such,

as well as so researchers/practitioners can quickly reference the relevant factors they should consider whether they are examining barriers, facilitators, or both.

Proper health behavior involves a limited but sustainable number of calories with the correct nutrients (Ard et al. 2016), as well as attaining physical activity that counterbalances those calories consumed and strengthens the body (Delany et al. 2014). It should be noted that there is a direct and linear relationship between physical activity and health status, and physical activity further serves as a buffer against many chronic diseases (Warburton et al. 2006). By knowing the common barriers/facilitators identified to date by research, these specific factors could be targeted to increase the chance of success for organizational health promotion efforts to better achieve employee health.

## Barriers and Facilitators to Making Healthy Decisions

Several researchers have sought to identify the barriers people face in organizations that prevent them from making healthy decisions (e.g., Allen, Hammerback, Harris, Hannon, & Parrish; Tessaro et al. 1998). Underlying many of these barriers and facilitators is the Theory of Planned Behavior (TPB; Ajzen 1991), which states that attitudes toward a behavior, the subjective norms, and perceived control over behaviors lead to intentions to do something. As long as nothing prevents someone from enacting his or her intentions, those intentions ultimately should lead to actual behaviors. One of the main mechanisms by which barriers act in this model is to prevent someone who might have the intention to eat healthily or exercise from actually completing the behavior, while facilitators would make it more likely for the behavior to occur. However, barriers and facilitators also play a role in other parts of the model, such as by creating a social norm that is more conducive to healthy behaviors or giving employees information that gives them a more positive attitude towards physical activity. Overall, the mechanisms behind the theory have been shown to be predictive of health eating (Conner et al. 2002) and exercise behaviors (de Bruijin 2011), which makes it a useful theory to framework the findings in this review.

These factors can have a profound effect on health behaviors, as Mazzola and colleagues (2017) found that the number of workplace barriers to healthy nutrition/exercise behaviors on a given day was related to their respective health behaviors on that day. Furthermore, the number of workplace facilitators reported was even more strongly related to the healthy behaviors on the day they happened. That same study further found that barriers occurred on an alarming 80% of workdays, so these are not rare events! Thus, this is something that employees face and must overcome on a nearly daily basis if they wish to live a healthy lifestyle. This shows how these workplace factors can affect an employee's ability to translate healthy intentions into action, ultimately having the potential to dramatically increase or decrease their probability of becoming obese. Interestingly, while facilitators were reported about 75% of days (or about three out of every 4 days) by employees, there were far fewer facilitators reported overall and many of them were more personally rather than organizationally initiated (e.g., meal planning). This makes the creation of health behavior facilitators a prime area for workplace health promotion with

the potential for substantial effects on appropriate weight loss and maintenance (Mazzola et al. 2017).

This paper seeks to identify and synthesize the current findings on workplace factors affecting healthy eating and exercise decisions in order to help researchers and practitioners who study or implement workplace health promotion efforts. Specifically, we set out to answer these research questions:

RQ1: What are the barriers/facilitators that have been identified in empirical studies whose purpose was to identify these factors in the workplace?
RQ2: Which of these barriers/facilitators have been found most frequently in these studies?

## Systematic Literature Review

To find relevant articles for our review, the EBSCO database was used, specifically PsycINFO and Academic Search Premier, searching for keywords that were relevant to this study. We used the following search terms: *occupational health, obesity, health promotion, facilitators, barriers, drivers, enablers, motivators, health, physical activity, exercise, nutrition, eating*. The initial search resulted in 42 articles that appeared relevant to our discussion of barriers and facilitators based on titles and abstracts. Then each overall paper and results section was examined for the following inclusion criteria: a) must be some type of empirical study meant to identify or measure prevalence of some types of barriers/facilitators to healthy behaviors, b) the study must be focused specifically on identifying multiple types of barriers and/or facilitators (by whatever name they are referred in that particular paper), c) identifying and/or measuring barriers/facilitators was a main focus of the article (as opposed to looking at how *one* barrier related to a specific outcome[1]), d) centered in the workplace (even if some nonwork factors were also considered or reported), and e) the healthy behaviors were at least in part specific to nutrition and/or exercise habits. Further, as part of point "e", we excluded articles that focused exclusively on workplace wellness program participation rates, as these do not get specifically at how the effects of overall barriers/facilitators affect health behaviors. We believe these created well-defined, specific inclusion criteria that aided in finding articles specific to the research question posed here (Rojon et al. 2011).

Each of the articles originally identified was reviewed independently and scored as to whether the articles met the inclusion criteria by the first and second author. The original ratings yielded 81% agreement between the first and second author, and all disagreements were then discussed until a consensus was reached regarding inclusion in the review. In the end, only 14 studies were retained as part of the systematic review. Specifically, ten articles were excluded for not focusing on work, nine were focused solely on health promotion implementation/organizational support, six examined one specific barrier-outcome relationship or were not specific to barriers/facilitators at all,

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[1] As our purpose was to examine what barriers and facilitators workers/participants identify as most prevalent or salient, studies that examined a single barrier and its relationship as chosen by the authors of those papers would introduce researcher bias into these prevalence numbers and were thus excluded.

and two concerned general weight management. The articles that were included are presented in Table 1, along with their basic methodology and focus. These studies are by nature mostly qualitative (or mixed using a qualitative portion to identify factors) as this allows the open-ended nature to identify the barriers/facilitators mentioned most commonly by workers. However, a few quantitative studies were included as long as participants were able to choose from a wide variety of factors to endorse. While this is not a substantial number, as can be seen from the results, these studies found a wide variety of barriers and facilitators affecting health behaviors, while also confirming the presences of some factors being reported more frequently. Finally, it has been suggested that making sure articles fit the inclusion criteria and purpose of a paper and have sufficient quality is more important than maximizing the sheer number of studies (Rojon et al. 2011).

Next, for the 14 articles that were included, the same two authors independently coded whether each article discussed either a) barriers to physical activity, b) barriers to healthy nutrition, c) facilitators of physical activity, and/or d) facilitators of healthy nutrition. Thus, each article received four separate codes, which resulted in a total of 56 scores. The two authors agreed on 50 of the 56 codes (89.3%), and then discussed the differential codes and came to a consensus on the final six. The final coding showed that 100% of the articles discussed barriers, while only 50% discussed facilitators. More specifically, barriers to physical activity were discussed in 79% of the articles, yet facilitators to physical activity were discussed in only 29% of the articles. Similarly, barriers to healthy nutrition were discussed in 57% of the articles, while the facilitators were only discussed in 36% of the articles. Thus, it is clear that much of the focus of the research thus far has focused on the factors preventing people from making healthy choices in the workplace as opposed to supporting these behaviors.

After reading through these 14 articles, we developed a taxonomy of specific barriers and facilitators, including examples of each factor. Subsequently, the first author coded each of the articles regarding the frequency of each factor in the workplace (see Tables 2 and 3). As would be expected, not all studies named or coded their barriers and facilitators the same, so the results of each study were coded based on a discussion between the authors regarding the description of each factor. In cases where frequencies were presented in the original study, those factors that were reported very infrequently or had low scores on the scales were not coded in this review. Since not all studies were looking to uncover all potential barriers/facilitators, and some studies looked at only barriers *or* facilitators (or only eating or exercise behaviors), the number of times a specific factor is identified by participants is not meant to be a strict measure of its importance or prevalence relevant to all other barriers and facilitators. Nonetheless, it does help researchers and practitioners understand what participants identify most often when asked what barriers and facilitators they encounter.

As mentioned, a facilitator may be very similar to having a lack of a certain barrier, but there might be aspects for research/practice for these factors that may be distinct and make them worthy of further discussion (as discussed more later). Therefore, we do at times present both sides of these issues in both the barriers and facilitators sections, but attempts were made not to simply repeat the same research across sections as much as possible. We have also coded barriers and facilitators into those factors that are physical, personal, social, and environmental for easy categorization and flow. However, some of these barriers/facilitators certainly may fit into multiple categories.

**Table 1** Summary of Studies Included in the Systematic Review

| Authors | Type of Study | Methods Used | Barriers Identified | Facilitators Identified |
|---|---|---|---|---|
| Allen et al. (2015) | Qualitative | Conducted 7 focus groups. Thematic content analysis to identify barriers and facilitators to physical activity among restaurant workers. | Exhaustion, low energy, long workdays, and exposure to unhealthy food. | Social exercising and the culture of the work teams and the organization. |
| Apostolopoulos et al. (2012) | Quantitative | Healthy Trucking Worksites Audit Instrument to identify the environmental barriers and facilitators present in 25 combined truckstops, trucking terminals, warehouses, and highway rest areas. | Physical, social, and informational environments. | Facilitators were found to be largely absent from trucking worksites. |
| Blackford et al. (2013) | Qualitative and Quantitative | Used 4 focus groups and 10 manager interviews to identify barriers and facilitators of physical activity and healthy eating in office-based worksites. | Being too tired, work commitments, working long hours, unhealthy food available in the office, lack of health options near the office, unhealthy vending options, and unhealthy food is cheaper than healthy food. | Enjoyment of physical activity, health benefits, being able to cycle or walk to work, having showering facilities at work, recreation teams at work, food being prepared at home, and knowledge of healthy nutrition. |
| Bredahl et al. (2015) | Qualitative | Used thematic structured 18 interviews to examine factors that influenced participation in a physical exercise program in the workplace. | Inflexibility of job planning (e.g., scheduling of work), interrupted work schedules, guilty conscience, colleagues (e.g., pressure from colleagues to keep working), misunderstood exercise schedule, no inspiration, monotony of exercise, competence of exercise instructor, dissatisfaction with progress, lack of praise or support for participation. | Support from leaders, flexibility in job planning, support from colleagues, reducing physical deterioration of the body, motivation to reduce pain (e.g., muscle tension from work stressors), free training, hope to reduce medical costs, using the exercises as inspiration, learning correct techniques of exercises, and enthusiasm of exercise instructor. |
| Hearn et al. (2018) | Quantitative | Used survey to examine the barriers to physical activity of 169 civilians and 205 military personnel in a military hospital. | Physical activity included lack of time, lack of motivation, pain or medical condition, discomfort with gym crowd, lack of support network, weather, lack of child care, financial cost, lack of experience or knowledge, one's own work, lack of parking at gym. | Not examined in this study. |

**Table 1** (continued)

| Authors | Type of Study | Methods Used | Barriers Identified | Facilitators Identified |
|---|---|---|---|---|
| Jaffee et al. (1999) | Quantitative | Used survey to examine incentives and barriers to physical activity among 393 working females. Survey included 13 divisions within a large corporation. | Lack of time in workday, self-conscious about exercising in front of others, lack of confidence in skills/abilities, concern about appearance, lack of exercise partner, self-conscious about exercising in front of men, already active outside of work. | Incentives for physical activity and psychological factors (e.g., fun/enjoyment, improved psychological well-being, and stress management) and physical factors (e.g., improved cardiovascular fitness, weight loss/maintenance, and improved muscle tone) |
| Mazzola et al. (2017) | Qualitative and Quantitative | Used mixed daily diary method to identify the barriers and facilitators present in the workplace and the impact they had on health behaviors for 93 workers across 4 days. | Workload, time constraints, temptation, social influences, lack of nutritious options, work environment, boredom, lack of knowledge, nonwork factors, fatigue, physical ailments, and availability of exercise options. | Availability of healthy options, time availability, motivation, social support, knowledge, work environment, workload, structured schedule, planning, proper sleep |
| Nicholls et al. (2017) | Qualitative and Quantitative | Systematic review of all literature on barriers and facilitators to healthy eating among nurses. | Long working hours, shiftwork, work stress, lack of healthy food options, lack of food storage and kitchen areas, social factors, awareness of being overweight, knowledge of obesity prevention, motivation, and self-efficacy. | Social factors (e.g., social support) and environmental factors (e.g., availability of fresh food). |
| Pridgeon and Whitehead (2013) | Qualitative | Interviews of 23 catering staff to identify drivers and barriers to eating healthy foods in public sector workplaces. | Changes in employee demographics, limited workplace facilities for preparing food, lack of work-life balance, cost of healthy food, limited access to healthy choices, unhealthy options in vending machines, health constraints, and dietary constraints. | Not examined in this study. |
| Schwetschenau et al. (2008) | Quantitative | Survey of 88 employees to examine barriers to participating in worksite fitness centers in a corporate setting. | Lack of time, lack of motivation, negative exercise attitudes, internal personal factors (e.g., embarrassment), and external factors (e.g., cost of the facility). | Not examined in this study. |
| Shrestha et al. (2017) | Qualitative | Conducted three focus groups of 8–9 workers each and in-depth interviews with cafeteria managers to identify barriers and facilitators | Environmental (e.g., higher cost of healthy foods), social (e.g., feeling powerless to negotiate for healthier options), and individual | Environmental (e.g., support from management and individual factors (e.g., knowledge of healthy eating). |

**Table 1** (continued)

| Authors | Type of Study | Methods Used | Barriers Identified | Facilitators Identified |
|---|---|---|---|---|
| | | of healthy eating in cafeterias at a wire manufacturing factory. | factors (e.g., preference for unhealthy choices). | |
| Stankevitz et al. (2017) | Quantitative | Conducted before/after survey to identify barriers to physical activity and healthy eating for participants in an employee weight management program in 124 participants in the program. | Lack of interest, lack of accessibility for physical activity, time constraints, physical discomfort, lack of self-control, lack of access to healthy foods, negative attitudes toward healthy eating, lack of knowledge about healthy eating, lack of support. | Not examined in this study. |
| Tessaro et al. (1998) | Qualitative | Conducted 13 focus groups to identify barriers and facilitators for making healthy choices in the workplace for blue-collar women. | Lack of willpower, lack of time, lack of determination, lack of support, and lack of knowledge and skill. | Having social support and encouragement, having an exercise or nutrition buddy, and having a role model. |
| Zunker et al. (2008) | Qualitative | Conducted 4 focus groups utilizing nomial group technique to identify the factors that influence physical activity and weight among African American women for a large corporation. | Lack of long-term worksite wellness programs; lack of time; high work stress that leads to overeating, eating unhealthy foods, and lower physical activity; unhealthy work culture; lack of healthy options; and multiple job demands. | Not examined in this study. |

**Table 2** Summary of the Barriers to Making Healthy Decisions in the Workplace

| Factors | Description | TPB Elements | Examples | *Prevalence |
|---|---|---|---|---|
| Physical | Physical characteristics of the workplace | PBC | Absence of access to healthy food options | 57% |
| | | PBC | Absence of access to exercise facilities/equipment | 14% |
| | | PBC, Intention | Weather | 21% |
| Personal | Characteristics of the individual or the individual's personal situation | PBC, Intention | Monetary consideration/High costs | 50% |
| | | Attitude | Discouragement/Not seeing results | 14% |
| | | Attitude, Intention | Preferences for sedentary activity/high fat foods | 14% |
| | | PBC, Intention | Lack of Energy | 36% |
| | | Norms, Intention | Guilt | 7% |
| | | Attitude, Intention | Self-control | 29% |
| | | Attitude | Lack of interest in health change | 29% |
| | | PBC, Intention | Lack of knowledge/consensus on healthy foods/exercise | 43% |
| | | PBC | Health and medical constraints | 29% |
| Social | Interpersonal factors within the work environment | Norms | Workplace culture/pressure/norms | 43% |
| | | PBC, Intention | Significant other or family not supportive/won't act healthy | 29% |
| | | PBC | Work/family intersection | 50% |
| | | Norms, PBC | Lack of managerial support | 7% |
| | | Attitudes, Norms | Self-conscious exercising in front of others | 21% |
| Organizational | Characteristics of one's job or job situation | PBC, Intention | Work load/work hours/time constraints | 79% |
| | | PBC, Intention | Job Demands | 43% |
| | | PBC, Intention | Work stress | 29% |
| | | PBC, Norms | Restrictive workplace policies/Scheduling | 7% |
| | | Norms, Intention | Marketing of unhealthier choices (food & exercise) | 7% |

*Prevalence indicates the percentage of articles where each factor was identified out of all included studies

**Table 3** Summary of the facilitators to making healthy decisions in the workplace

| Factors | Description | TPB Elements | Examples | *Prevalence |
|---|---|---|---|---|
| Physical | Physical characteristics of the workplace | PBC | Presence of access to healthy food options | 21% |
| | | PBC | Presence of access to exercise facilities/equipment | 29% |
| | | PBC | Presence or access to showering facilities | 7% |
| Personal | Characteristics of the individual or the individual's personal situation | PBC, Intention | Proper eating/exercise knowledge | 14% |
| | | Intention | Ability to plan and prepare healthy meals/exercise time | 14% |
| | | Attitude | Perceptions of self/feeling healthier (e.g., clothes fit better) | 14% |
| | | Attitude, Intention | Enjoyment/acceptance of exercise/eating well | 14% |
| Social | Interpersonal factors within the work environment | Norms, Intention | Social support network/team exercise | 36% |
| | | Norms, Intention | Exercise or diet partner | 14% |
| | | Norms, PBC | Managerial support | 14% |
| Organizational | Characteristics of one's job or job situation | Norms, PBC | Permissive workplace policies | 7% |
| | | Norms, PBC | Health promotion initiatives | 14% |
| | | Norms, PBC | Work flexibility | 21% |

*Prevalence indicates the percentage of articles where each factor was identified out of all included studies

Definitions for each of these categories are provided in Tables 2 and 3, as well as the aspects of the TPB each factor most affected by the barrier/facilitator (Ajzen 1991). While this review focuses on workplace barriers and facilitators, as healthy lifestyles take place throughout the entire spectrum of an individual's life events, some of the factors discussed will bleed into other life aspects as well (e.g., work-family balance). We chose to categorize and discuss all factors discussed as important in these studies, as all studies occurred in the workplace, and thus employees are indicating these barriers/facilitators as important to them.

## Physical Barriers and Facilitators

One physical barrier in the workplace is the presence of or access to unhealthy food options, which was one of the more common barriers identified in previous research and can have a profound effect on what employees eat (Chang et al. 2008). For instance, Pridgeon and Whitehead (2013) found that vending machines encourage employees to snack on unhealthy food options. Furthermore, in a survey of Western Australian employees, 30.6% of employees stated that the presence of unhealthy food in the office was a barrier to eating healthy, and 28.8% of employees stated that the lack of healthy choices near the workplace was a barrier to eating healthy (Blackford et al. 2013).

Meanwhile, the availability of healthy food options is going to affect employees' ability to eat nutritiously, especially while at work. In a study examining how cafeteria options affected food choice, Jeffrey et al. (1994) found that increasing the amount of vegetable and fruit options in the cafeteria (and making them more affordable) created a 3-fold increase in the number of these items purchased. However, not unexpectedly, once the cafeteria returned to its old menu options and pricing, the frequency of fruit/vegetable purchases returned to baseline, meaning the physical environment needs to continuously be a facilitator for employees to maintain this behavior.

Similarly, the absence or lack of access to exercise facilities and equipment was reported as a barrier (Mazzola et al. 2017). Apostolopoulos et al. (2012) found that only 8% of truck drivers exercise regularly, in part because they lack access to exercise resources, potentially explaining why 85% of truck drivers in the United States are overweight/obese. The authors further state this as a reason for this crisis is the lack of access to health-promotive resources.

The presence of exercise facilities or amenities. Accessibility and opportunity have been shown significantly related to actual physical activity (Humpel et al. 2002). Even when exercise options are present in the workplace, the fact that some employees may get sweaty during their exercising can act as a barrier (Bredahl et al. 2015). Thus, lack of shower facilities may prevent people from exercise during work hours (making it difficult to turn their intentions into actual healthy exercise behaviors) or stop them from making the healthy decision to actively commute through walking or biking to work. For instance, one study showed that 62.5% of men and 25.3% of women stated that access to shower and changing rooms enabled them to engage in physical activity during the workday (Blackford et al. 2013). Indeed, the presence of at least one amenity type, such as a pleasant place to walk, a gym, fitness classes, or shower and changing rooms, is associated with higher levels of leisure time physical activity (Watts and

Mâsse 2013). Given the general lack of studies looking at facilitators at all, the prevalence of healthy food and exercise facility access in these studies (21% and 29%, respectively) make these relatively salient facilitators and an area that can be utilized to drive healthy behaviors.

Safety can also be an issue, particularly for physical activities that would take place outside. Employees who work and/or live in unsafe areas may be less likely to want to walk or run outdoors, especially in the night time hours after work when it may be dark. Research conducted by McNeill et al. (2006) demonstrated that physical environment factors directly impact physical activity, such that individuals were more likely to take walks if they felt they were in a secure environment. For instance, Nies et al. (1996) found that neighborhood safety was a major barrier preventing African-American women from engaging in physical exercise. A related problem can be weather-related, which was reported as a potential barrier to physical activity (Mazzola et al. 2017). Specifically, poor weather has been related to a higher probability of sedentary behavior (Salmon et al. 2003). While there is little that can be done about the actual weather, it is important to be aware of the weather as a potential barrier for employee health behaviors. Thus, if organizations want employees to engage in more physical activity, they should find ways to provide safe and accessible exercise and have options that are not dependent on the weather (e.g., indoor facilities).

While it is not necessarily the responsibility of organizations to provide access to healthy food options or exercise/shower facilities, access to unhealthy options and the lack of access to healthy options is enough to prevent employees from engaging in healthy behavior. Moreover, providing access to healthy food choices and exercise facilities *helps* employees make healthier choices. This fits well with the TPB (Ajzen 1991), as the intention to eat well/be active may not be enough if the resources are not present to easily perform the behavior. Lack of access to healthy nutrition and exercise resources may also affect the perceived control people believe they have over their healthy behavioral choices per the TPB (Ajzen 1991).

## Personal Barriers and Facilitators

Studies have consistently shown that there are many personal barriers inhibiting people from engaging in healthy decisions, which organizations should be aware of when planning their health promotion initiatives (Blackford et al. 2013), and several such factors came up frequently in this review. Health behaviors do not happen in a vacuum, and a health promotion effort designed without considering the employees' total lifestyle, attitudes, and cognition is likely to fail.

Monetary limitations often prevent people from making healthy food choices and partaking in physical activity, which is likely why it was identified in half of the studies examined. Healthy food is often more expensive and less convenient than unhealthy food. Many people who live in poorer or less affluent neighborhoods may reside in what is known as a food desert, which is a neighborhood or community that has limited to no access to healthy *and* affordable food (Wright et al. 2016). In food deserts, it is can be difficult to near impossible to obtain healthy food because of the lack of traditional grocery stores many of us take for granted, but instead, have to rely on convenience stores and fast food chains filled with mostly nutritionally inadequate food. This is

problematic for employers because food desert status is positively associated with obesity status (Chen et al. 2016). Furthermore, if the organization is located in a food desert or employees generally do not have access to affordable healthy food options, this lessens their real and perceived control over making healthy food choices, which may also lower their intentions to even try to make them (i.e., Ajzen 1991).

Financial situation and costs can also be a barrier to engaging in physical activity. While some exercise might be free or low cost (e.g., outdoor running and home workouts), gym memberships, proper trainer instruction, and equipment for home use are not and maybe quite costly. Those who reported financial cost as a barrier to physical activity were more likely to participate in a variety of sedentary behaviors (Salmon et al. 2003). Organizations can and should make an effort to provide gym space, workout classes, and/or shower facilities, but unfortunately, some research indicates that these are typically only utilized by people who are already regularly exercising (Abraham et al. 2011), so organizations should also do more to target health promotions among currently sedentary individuals. The presence of these free/cheap options for physical activity can act as a facilitator, enhance employee's perceived control of their exercise behavior, and communicate the norm that employee health and well-being is important to the organization.

Another barrier can be the desire for quick results from a lifestyle change. Individuals who are trying to increase healthy eating and physical activity in their lives, do not typically have these activities already in their daily routine and may assume that a short commitment to these behaviors will result in noticeable differences. By not seeing these quick results, individuals may get discouraged and give up, affecting their attitude towards eating healthy and being active, making it hard to follow the healthy program (Chang et al. 2008). Similar but distinct is the issue that self-control (and the self-efficacy to control one's self-control) can be a major barrier to avoiding temptations (Chang et al. 2008; Mazzola et al. 2017). Lack of self-control was discussed in several studies and seems to play a large role in whether individuals will make healthy decisions and partake in healthy behaviors.

However, a factor that could be harnessed towards getting a person to live a healthier lifestyle is their appearance and perception of themselves. Personal appearance, how their clothes fit, and their ability/inability to be active with their children were all given as motivating factors for low-income mothers to address weight gain (Chang et al. 2008). Organizations could utilize campaigns that promote not only the physical health benefits of proper diet and exercise (as is often done), but also the physical appearance, self-esteem, mental health, and overall well-being effects as well, to further entice employees to participate in workplace health promotion.

Additionally, perceptions and preferences may play a role in how likely someone is to make healthy choices. Specifically, one's preferences for unhealthy food or more sedentary activities may act as a barrier to making healthier decisions. In a survey of over 14,000 people within the European Union, approximately 14% of people listed the unpleasantness of healthier food as a major barrier to eating healthier (Lappalainen et al. 1997). While this may not seem like a large percentage, this translates to approximately three out of every 20 employees who may not eat healthy simply because they do not like the taste of healthy foods. Efforts aimed at finding ways to change the attitudes and perceptions of healthy foods among these individuals may prove fruitful can be used as a facilitator.

Similarly, those who report more liking of/enjoyment for sedentary behaviors are less likely to partake in physical activity (Salmon et al. 2003). On the positive side, the enjoyment of healthy behaviors was also a facilitator, so organizations could encourage employees to find the activities they actually enjoy to enhance the likelihood of sustained change (Ungar et al. 2016), and there is potential that overall enjoyment is higher in some activities than others, such as high intensity interval training (Thum et al. 2017). Accordingly, organizations may need to find ways to get employees to find more enjoyment in physical activity behaviors as well, helping to create a healthier subjective norm towards exercise. However, this could be tricky, as some individuals feel that health behavior is a personal choice (or have a negative attitude towards healthy behaviors) and that organizations should not be involved in promoting healthy eating and exercise behavior in their employees (Pridgeon and Whitehead 2013). This could render many health promotion efforts useless for these people and hinder the likelihood they will act healthy (although many but not all of these individuals may have very low intentions toward acting in healthy ways anyway). On the other hand, it should be noted that in a small, qualitative sample, Cosco et al. (2015) found that the majority of participants agreed that organizations can and should work to promote health.

Some people simply do not want to change their habits or feel it would be too great a change for them at the current time (Lappalainen et al. 1997), as indicated in 29% of studies. If a person's salient belief (the first one that comes into their mind when thinking about health change) is that it is negative or not worth the extra effort, they are less likely to choose to make those healthy choices (Armitage and Conner 1999). This is also consistent with the Transtheoretical Model of Behavior Change that states people exist at different stages of readiness for any change (in this case health behavioral change) and that many employees may be in the precontemplation stage and are making no preparations or considerations to start eating healthier or getting more physical activity (Mastellos et al. 2014). Organizations should target their messages towards employees at different stages of readiness (e.g., preparation, maintenance) and create an environment that is not overly pushy to those not currently pursuing change, but also feels open for them when/if they make the move towards the action stage of health behavior change. Relatedly, many studies discussed how people had medical conditions or previous injuries that prevented most types of physical activity. It is important for employers to be aware of these limitations, be careful not to exclude or discriminate against these employees in health promotion, and potentially find creative ways to support health behaviors that fit with those prescribed by their medical professionals.

One of the most common barriers to physical activity is a lack of energy (reported in 36% of studies reviewed). For instance, in a survey of office-based employees, 54.1% indicated that being too tired was a major barrier to engaging in physical activity (Blackford et al. 2013). When examining employees' energy expenditure, those who engage in more occupational physical activity, such as blue collar workers, were the least likely to engage in leisure-time physical activity (Kaleta and Jegier 2005). One survey of working women found that being too tired/not having enough energy was a barrier to physical activity for nearly half of the women who were not currently physically active but were thinking about starting an exercise regimen (Jaffee et al. 1999). This is potentially due to the work environment causing a loss of a person's

resources through ego-depletion (Baumeister 2014), leaving them without the energy and self-control to make healthy decisions later on in the day, which could cause their intention to exercise not to translate into the actual behavior. One possible way for organizations to combat this barrier is to provide opportunities for employees to engage in physical activity during the workday, which will help ensure that employees are able to exercise before they run out of energy at the end of the workday, and some research has shown this to relate to lower cholesterol and weight loss (Taylor et al. 2010). Related to the TPB, research has shown that almost no one that has no intention to exercise does so (disinclined actors), but plenty of people who intend to exercise still do not (inclined abstainers) (Rhodes and Plotnikoff 2006).

Another major personal barrier to making healthier decisions identified is guilt. Specifically, people do not eat healthily or do not engage in leisure-time physical activity because they feel guilty about doing so. This guilt could be towards the organization or other people. For instance, Bredahl et al. (2015) found that employees felt guilty toward their employer for using a workplace exercise program. In essence, the workers felt guilty because they thought they should choose work before anything else. One study that examined the physical activity barriers among working mothers and fathers found that parents feel guilty towards their family (Mailey et al. 2014), while another study found that women felt guilty about engaging in physical activity because they were taking time away from their other roles, such as mother, wife, and employee (Eyler and Vest 2002).

Finally, another common barrier was a lack of knowledge of the proper nutrition and exercise behaviors to partake in to reach their health and weight loss goals (Tessaro et al. 1998). Employees sometimes worry that they will hurt themselves if they exercise without the proper instruction and knowledge, potentially even leading to a "fear" of certain types of exercise (Zunker et al. 2008). Participants in these studied complained of mixed signals, such as research constantly changing what foods should and should not be eaten, and in what combination/quantity or just flat out had wrong perceptions of what constituted "healthy food" (Shrestha et al. 2017). Nutrition science and recommendations are constantly changing and can necessarily be individualized and specific to age, gender, and other factors (Kreuter et al. 2000). Thus, if the amount of actual knowledge someone has about health behaviors is inadequate, it is unlikely those employees will create intentions to exercise or eat nutritiously.

On the other hand, possessing knowledge of one's healthy options and appropriate behaviors, such as knowledge about the right foods and quantities to eat or how to exercise safely, can be important. For instance, exercise may seem daunting (or even dangerous) to those who do not know the right routines to reach their goals and the proper form to avoid injuries. Fear of injury was reported as a barrier to exercise adoption in older women in the early stages of exercise adoption (Heesch et al. 2000). One way to minimize this fear is to educate employees about exercising safely and methods of minimizing the risk of injury, such as stretching, while another could be supervised options, either in a group exercise class or an attendant/trainer at an on-site facility. Oenema et al. (2001) investigated how computer-tailored nutrition education could be used to improve healthy eating behaviors. Using a pre-test/posttest design that included a control group, they found the intervention group had higher intentions to eat less fat, and indeed, were less likely to eat fat and more likely to eat fruits than the control group (although vegetable intentions and intake were not changed).

Organizations could hold sessions that inform of employees of healthy eating behavior, possibly even including recipe instruction and food planning and preparation techniques (a facilitator discussed here later). Some health insurance providers may already provide personal trainers or exercise support into their wellness plans for organizations to utilize.

In the Mazzola and colleagues study (Mazzola et al. 2017), by far the most common facilitator to nutrition reported was planning (45% of *all* responses), including behaviors like being able to portion out meals beforehand and bring them to work (although it was reported in only one other study here, likely due to the lack of papers looking at nutrition facilitators overall; Blackford et al. 2013). This goes hand in hand with knowledge, as people need to be educated about how to properly plan, prepare, and package weekly menus, such as lunches to be consumed at work. Furthermore, educational programs should also focus on how to avoid losing focus and discontinuing healthy behaviors. One study showed that "it took much planning to eat a healthier diet" as a frequently endorsed barrier for those in a workplace obesity intervention (Stankevitz et al. 2017), but research has shown that taking the time to plan and cook meals ahead of time is associated with an increase in food variety and quality of diet and lowered obesity levels (Ducrot et al. 2017). Planning makes it much easier to turn intentions to eat healthy into action, as opposed to eating nutrition poor fast or available food due to lack of options.

## Social Barriers and Facilitators

Studies have shown peer influences have a profound effect on what someone chooses to eat (Nestle et al. 1998) and their exercise behaviors (Wynd and Ryan-Wenger 2004). In the workplace setting, imagine a scenario in which a group of coworkers routinely goes out to eat as part of the culture/relations in the workplace. The places the group chooses to dine will influence the dietary intake of all of the individuals in the group, and if they repeatedly choose fast food establishments that serve food high in fat and calories, norms may develop that discourage individual group members from making healthy food choices and/or bringing their own meals. These type of culture and social pressure issues showed up in almost half of the studies reviewed (43%), which of course will affect the subjective norms around health behaviors that lead to intentions to do those behaviors (Ajzen 1991). In Mazzola et al. (2017), temptations and social influences were common examples of nutrition barriers provided by participants (27.59% overall). Similarly, while Cason and Wenrich (2002) specifically examined students instead of employees in their study, they found that participants indicated that peer influence played a large role in whether the participants ate healthily or not.

Workplace social temptations are a very common barrier for those trying to eat healthily. In a study of barriers among those in a workplace obesity intervention, some of the highest scores were for the items: "ate a lot of meals away from home," "holidays and special occasions," and "high fat foods are part of my culture" (Stankevitz et al. 2017). While these are issues that may occur throughout one's life, not simply in the workplace, these issues show how easy it is to be sidetracked by co-workers going out to lunch, workplace parties, and the overall culture for (un)healthy eating that surrounds employees. Moreover, some employees also report that their family does not support them eating nutritiously (Stankevitz et al. 2017), so organizations could focus on

creating a culture that supports healthy choices in the workplace that could carry over into the home.

Social support, as a facilitator, can similarly facilitate eating healthy. For instance, a group of manual workers reported that their food choices are often determined by their spouses (Pridgeon and Whitehead 2013). When spouses (or significant others) prepare meals at home and lunches to be taken to work that contains healthier foods, it becomes easier to eat healthily. Furthermore, spouses would be more likely to know which healthy options will be consumed based on their partner's food preferences.

Social support is also a major predictor of whether someone engages in physical activity and was the most frequently discussed facilitator in this review (36%). Army reserve, active duty army, and civilian hospital workers all indicated that social support helped them in their efforts to be physically active (Wynd and Ryan-Wenger 2004). Social support was given as a motivating factor for overweight, low-income mothers wanting to eat healthy and exercise more (Chang et al. 2008). Even having people close to one's self who also engage in healthy behaviors can have a profound effect on sticking to a diet or exercise regimen. As such, for some employees, having a coworker to exercise with acts as a facilitator. This may be because of the social aspect of exercising together and the notion that the employees can hold each other accountable (Bredahl et al. 2015).

Managerial and organizational support has been indicated as factors that are necessary for health promotion to be effective (Pelletier 2001). For instance, support from leadership was found to be one of the most important facilitators of engaging in a workplace exercise intervention (Bredahl et al. 2015). By recognizing that a heavy workload and long hours make living a healthy lifestyle difficult (which will be discussed in more detail soon), organizations can provide support for their employees, which may yield positive health outcomes for employees even if it may mean a slight dip in productivity or a need for more employees. Managerial support could range from sending employees information about workplace wellness programs via email to actively participating in the programs with employees.

Furthermore, work and home life interaction came up very frequently in these studies (50%) and shows the importance of including the entire family and life situation into account when developing health promotion. Allen and Armstrong found that family-work and work-family interference were related to the poor health behaviors of low physical activity and higher fatty food consumption (2006), both of which were also related to overall health in that study. These findings again reiterate how organizations cannot ignore family/home life when trying to increase overall employee physical health.

An interesting finding was 3 of the studies (21%) finding some version of the response that people felt self-conscious about exercising in front of co-workers. This is a very specific but important factor to consider, as it is usually those who are farthest from their health change/weight loss goals who would have these issues. Health promotion initiatives need to be carefully planned in ways that help make all participants feel comfortable, and these findings illustrate why simply building a gym in the workplace is not the catch-all solution many organizations hope it will be (Abraham et al. 2011). By being sensitive to these social barriers in the workplace, organizations can improve the feeling of control employees perceive they have over their healthy choices and help intentions become behaviors.

## Organizational Barriers and Facilitators

Stress can profoundly affect the (in)frequency of healthy behaviors while also being linked to poor physical health indicators (Dimsdale 2008; Nixon et al. 2011). Long work hours and high workloads have been indicated frequently as barriers to a healthy lifestyle, and time constraints were the most common barrier identified among all types in this review (79%). Coupled with both job demands (mentioned in 43% of the studies here), and it is clear work-related stress plays a profound role in making healthy nutrition and exercise decisions. This is in line with ego depletion, in that individuals may not have enough physical and mental energy left after a stressful work day to make the choices they should even if the intention was there (Baumeister 2014), to say nothing of that exercises or cooking healthy food takes time they might not have. Wardle et al. (2000) found that participants who work a high number of hours (average of 47 h/week) ate more saturated fat and sugar than those who work a low number of hours (32 h/week). Similarly, when Mazzola et al. (2017) asked participants to provide organizational barriers to their healthy behaviors, participants provided workload and time constraints as the 1st and 4th most prevalent barrier responses for nutrition behaviors (19.92% and 10.34%, respectively), and the 1st and 3rd most prevalent responses for barriers to exercise behaviors (26.79% and 15.58%, respectively). Furthermore, one study of European workers found that the lack of time was the number one barrier to following nutritional advice (Lappalainen et al. 1997). An employee who is particularly stressed may be unlikely to develop intentions to exercise (due to feeling a lack of perceived control), and even if they do, it is unlikely they will find the time/energy to translate that intention into behavior.

Having lots of work or stress may make employees feel like they have less control over their nutrition and exercise choices, ultimately leading them to have less intention to do so (and thus less eventual health behaviors; Ajzen 1991). For instance, the results of a daily diary study show that the number of daily hassles a person encountered was related to an increase in consumption of high fat and high sugar food and a decrease in vegetable consumption (Connor et al. 2008). Another diary study found that daily job demands negatively affected employees' physical activity the day the job demands occurred (Payne et al. 2010). These organizational barriers can lead to a reduced likelihood of participating in the recommended amounts of daily physical activity (Salmon et al. 2003), as well as a lack of resources for putting effort into sporting activities (Sonnentag and Jelden 2009). Ultimately, this workplace stress could lead to weight gain for employees, as was found in a study of young female workers in Switzerland where an increase in social stressors related to a rise in BMI during the same time period (Kottwitz et al. 2014).

Organizations can do more to lower workload and stress for their employees, creating time availability and less strain as facilitators. This can be difficult given that work needs to be done, and the bottom line is often going to inform how many workers are employed and how much work they need to each complete. However, research has routinely shown that lowered stress leads to greater productivity in the long run (Donald et al. 2005). Similarly, organizations can find ways to incorporate physical activity throughout the day both for improved health and coping with stress. One study found that even short bouts of physical activity during the work day can have positive effects on work performance, mood, and body mass index (Barr-Anderson et al. 2011).

Further, a recent longitudinal study found that having a job that is moderately enriching (but not so "enriching" as to increase workload and overall stress) lowers indicators of abdominal obesity over time (Fried et al. 2013).

In addition to time and workload concerns, stressful work and life events can be barriers to health behaviors. For instance, in a sample of low-income, overweight mothers, stressful experiences have been shown to initiate emotional eating events and make it difficult to partake in healthy nutrition and exercise behaviors (Chang et al. 2008). Even when engaging in healthy behaviors, workload and job demands may lead to a preoccupation with the work demands (Bredahl et al. 2015). Lowered overall stress is also related to better mental and overall health (e.g., Albertson et al. 2001), so this one type of intervention that can help employees and organizations through a variety of avenues.

Organizations can provide a variety of health promotion initiatives, which may signal the value the company places on employee health (and signal there are appropriate social norms for health behaviors) (Harden et al. 1999). Unfortunately, the results overall on workplace health promotion has been mixed at best (Dishman et al. 1998), some of which we have already discussed in this review (e.g., Dishman et al. 2010; Jeffrey et al. 1994). However, the presence of a health promotion program *can* facilitate healthy decisions and behaviors, at least for some employees. For example, Oenema et al. (2001) found that web-based tailored nutrition training positively affected nutrition awareness and intention to change, which then hopefully translates into actual behavior (e.g., de Bruijin 2011). While we have discussed just a few examples in this review, a well-designed, empirically-supported, organizational health initiative can have positive effects on employee health, especially when the barriers and facilitators discussed here are considered. At least one study reviewed here mentioned "work recreation teams" as a facilitator to physical activity, although this was more prevalent in men than in women (25.0% to 5.7%; Blackford et al. 2013).

Specific organizational policies can also profoundly affect health decisions and behaviors and eventual health outcomes. One of these policies is workplace flexibility, which may make it easier for employees to plan and prepare healthy meals, eat healthy meals, and/or fit exercise routines into their daily routines. Survey results from over 500 companies found that health culture and policies help create supportive leadership and ultimately lead to reduced health risks for employees (Aldana et al. 2012). A recent review of studies that utilized only policy or environmental changes for health promotion found some evidence of their effectiveness for positive nutrition and physical activity outcomes, though the support was limited overall (Kahn-Marshall and Gallant 2012). Much more promising results were found for interventions that had multiple components to them, further emphasizing the importance of organizational and managerial support. For example, one study that included putting nutrition labels on cafeteria and vending machine foods, changing catering policies to emphasize healthier options, and adding space and equipment for exercise saw significant increases in both exercise behaviors and fruit and vegetable consumption (Emmons et al. 1999). There was no significant reduction in smoking behaviors, although this would be expected given a lack of focus on that behavior in the intervention, and further validates the need for targeted health promotion and elimination of barriers specific to the intended health behaviors. These findings suggest that part of the lack of universally beneficial results regarding health promotion may be due to small effect sizes for any one type of intervention.

Finally, the way that certain foods are marketed can affect the way they are perceived and ultimately consumed, according to one study. Pridgeon and Whitehead's (2013) study noted that marketing food in the workplace as healthy made it feel "more like a prescription than for some kind of enjoyment". On the other hand, as mentioned above, if people are not made aware of the healthy options for their purchase or consumption, they will not be able to utilize these choices, so it can be a delicate balance for organizations.

## Conclusions/Future Research

This systematic review has identified, categorized, and synthesized many of the barriers that employees face in or related to the workplace when trying to live a healthy lifestyle and regulate their weight. Similarly, we have provided numerous suggestions for how organizations can better remove barriers to healthy eating and exercise behaviors and facilitate employees making healthy choices. Ultimately, these factors likely affect behavior frequency of eating healthy and physical activity through increasing the relationship between intentions and behaviors, as well as improving perceived control and subjective norms towards this choice as posited by the TPB (e.g., Ajzen 1991; Conner et al. 2002). These behaviors then relate to the prevalence of obesity among employees in an organization as well as nation- and world-wide), and the various consequences that has for the individuals and organizations (Gebhardt and Crump 1990). Ultimately, the goal for individuals and organizations might be to make a healthy choice and positive consequences of those choices be the salient beliefs for the employees (Armitage and Conner 1999). We also hope this review helps researchers and practitioners continue to discover barriers and facilitators and study new relationships with the ones identified here, as well as invent new ways to support healthy behaviors in the workplace not mentioned here or even considered yet.

While there was certainly overlap between barriers and facilitators (e.g., lack of healthy food options versus availability of healthy food), both sides need to be considered so employers can remove the barriers and create facilitators in the work environment. There are also other factors that were only mentioned in one or the other factor (e.g., weather as a barrier, social support as a facilitator), and some research has at least suggested that barriers and facilitators play different roles in how they affect behavior, such as facilitators having a stronger relationship overall to actual behaviors than barriers (e.g., Mazzola et al. 2017). We suggest that future research continue to look at how exactly barriers and facilitators act differently on individuals, how they can effectively be harnessed to improve overall health, and when/if they should be considered separate constructs or two ends of the same continuum.

This review certainly has its limitations and is not meant to be a complete list and prevalence of all barriers and facilitators to healthy behaviors in the workplace. Instead, it should serve as a summary of the literature so far that can help to inform future research and ongoing application efforts. We could only catalog the research that has been done so far and that was available in the literature, and the coding was limited by most studies investigating only a small part of the phenomenon. In particular, facilitators have been significantly understudied with only five of the 14 studies here examining/identifying them, which limits the amount of information on certain types

of factors (e.g., exercise facilitators have been very infrequently studied). Indeed, studies that identify greater numbers of barriers and, especially, facilitators will provide more information for potential intervention targets. Given the current prevalence of obesity and overweight status in the American workforce, we find it improbable that only one or two barriers/facilitators are present in most worksites.

Further, some investigated specific occupations such as truckers (Apostolopoulos et al. 2012) or caterers (Pridgeon and Whitehead 2013), which limits the generalizability of *their* findings, but should enhance the generalizability of the current review since many different work settings are present in the various samples. However, given the small number of studies conducted on each of these occupations, we could not examine differences across or comparisons between specific occupations. As researchers continue to examine barriers/facilitators in various occupations, one next step for future research could be to examine whether barriers/facilitators are unique to specific occupations or whether they generalize across occupations. We suspect that many occupations will have their own unique barriers and facilitators, but that many barriers/facilitators will generalize across all occupations.

Due to the mixed results of workplace health promotion research to date (Dishman et al. 2010), some have suggested that targeting barriers and facilitators could be a fruitful avenue for improving organizational efforts to lower obesity and increase physical wellness (Goetzel and Ozminkowski 2008). Organizations can and should play a key role in combating the obesity epidemic because they are well-positioned to affect a larger number of people with specific, targeted health promotion. Future research should continue to look at these barriers and facilitators, search optimal ways for affecting them and healthier decision making in the workplace, and continue to identify others in our changing work environment. Ultimately, as noted throughout this review, targeting barriers and facilitators in health promotion *should* increase perceived control over health behaviors, improve positive attitudes toward them, and facilitate a subjective norm that encourages them. This ultimately will help employees make intentions to make healthy behavioral choices and reduce the barriers to turning those intentions into actual proper nutrition and physical activity. It is important that organizations, health professionals, and researchers recognize and understand the barriers and facilitators presented here when developing their programs/initiatives to increase healthy nutrition and exercise while seeking to reduce obesity and its associated risk of early death.

# References

Abraham, J. M., Feldman, R., Nyman, J. A., & Barleen, N. (2011). What factors influence participation in an exercise-focused, employer-based wellness program? *INQUIRY: The Journal of Health Care Organization, Provision, and Financing, 48*(3), 221–241. https://doi.org/10.5034/inquiryjrnl_48.03.01.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Albertson, K., Nielsen, M., & Borg, V. (2001). The Danish psychosocial work environment and symptoms of stress, the main, mediating, and moderating role of sense of coherence. *Work and Stress, 15*(3), 241–253.

Aldana, S. G., Anderson, D. R., Adams, T. B., Whitmer, R. W., Merrill, R. M., George, V., & Noyce, J. (2012). A review of the knowledge base on healthy worksite culture. *Journal of Occupational and Environmental Medicine, 54*(4), 414–419. https://doi.org/10.1097/JOM.0b013e31824be25f.

Allen, T. D., & Armstrong, J. (2006). Further examination of the link between work-faimly conflict and physical health: The role of health-related behaviors. *American Behavioral Scientist, 49*, 1204–1221.

Allen, C. L., Hammerback, K., Harris, J. R., Hannon, P. A., & Parrish, A. T. (2015). Feasibility of workplace health promotion for restaurant workers, Seattle, 2012. Preventing Chronic Disease: Public Health Research, Practice, and Policy, 12.

American Bureau of Statistics. (2013). Profiles of Health, Australia, 2011–13. Retrieved from http://www.abs. gov.au/ausstats/abs@.nsf/Lookup/bySubject/4338.0~2011–13~Main Features~Dailyintakeoffruitandvegetables~10009.

Apostolopoulos, Y., Shattell, M. M., Sönmez, S., Strack, R., Haldeman, L., & Jones, V. (2012). Active living in the trucking sector: Environmental barriers and health promotion strategies. *Journal of Physical Activity & Health, 9*(2), 259–269 Retrieved from http://libezp.lib.lsu.edu/login?url=http://search. ebscohost.com/login.aspx?direct=true&db=psyh&AN=2012-04031-009&site=ehost-live&scope=site.

Ard, J. D., Miller, G., & Kahan, S. (2016). Nutrition interventions for obesity. *Medical Clinics of North America, 100*(6), 1341–1356. https://doi.org/10.1016/j.mcna.2016.06.012.

Armitage, C. J., & Conner, M. (1999). Distinguishing perceptions of control from self-efficacy: Predicting consumption of a low-fat diet using the theory of planned behavior. *Journal of Applied Social Psychology, 29*, 72–90.

Audrey, S., & Procter, S. (2015). Employers' views of promoting walking to work: A qualitative study. *The International Journal of Behavioral Nutrition and Physical Activity, 12*. https://doi.org/10.1186/s12966-015-0174-8/.

Barr-Anderson, D., AuYoung, M., Whitt-Glover, M. C., Glenn, B. A., & Yancey, A. K. (2011). Integration of short bouts of physical activity into organizational routine. *American Journal of Preventive Medicine, 40*(1), 76–93. https://doi.org/10.1016/j.amepre.2010.09.033.

Baumeister, R. F. (2014). Self-regulation, ego depletion, and inhibition. *Neuropsychologia, 65*, 313–319. https://doi.org/10.1016/j.neuropsychologia.2014.08.012.

Berset, M., Semmer, N. K., Elfering, A., Jacobshagen, N., & Meier, L. L. (2011). Does stress at work make you gain weight? A two-year longitudinal study. *Scandinavian Journal of Work, Environment and Health, 37*, 45–53.

Blackford, K., Jancey, J., Howat, P., Ledger, M., & Lee, A. H. (2013). Office-Based physical activity and nutrition intervention: Barriers, enablers, and preferred strategies for workplace obesity prevention, Perth ,Western Australia, 2012. *Preventing Chronic Disease, 10*(1), 1–11.

Borak, J. (2011). Obesity and the workplace. *Occupational Medicine, 61*(4), 220–223. https://doi.org/10.1093/occmed/kqr030.

Bredahl, T. V. G., Særvoll, C. A., Kirkelund, L., Sjøgaard, G., & Andersen, L. L. (2015). When intervention meets organisation: A qualitative study of motivation and barriers to physical exercise at the workplace. *The Scientific World Journal, 2015*, 1–12. https://doi.org/10.1155/2015/518561.

Cason, K. L., & Wenrich, T. R. (2002). Health and nutrition beliefs, attitudes, and practices of undergraduate college students: A needs assessment. *Topics in Clinical Nutrition, 17*(3), 52–70.

Chang, M., Nitzke, S., Guilford, E., Adair, C. H., & Hazard, D. L. (2008). Motivators and barriers to healthful eating and physical activity among low-income overweight and obese mothers. *Journal of the American Dietetic Association, 108*, 1023–1028. https://doi.org/10.1016/j.jada.2008.03.004.

Chen, D., Jaenicke, E. C., & Volpe, R. J. (2016). Food environments and obesity: Household diet expenditure versus food deserts. *American Journal of Public Health, 106*(5), 881–889. https://doi.org/10.2105/AJPH.2016.303048.

Conner, M., Norman, P., & Bell, R. (2002). The theory of planned behavior and healthy eating. *Health Psychology, 21*, 194–201.

Connor, D. B. O., Jones, F., Conner, M., Mcmillan, B., & Ferguson, E. (2008). Effects of daily hassles and eating style on eating behavior. *Health Psychology, 27*(1), 20–31. https://doi.org/10.1037/0278-6133.27.1 (Suppl.).S20.

Cosco, A., Mazzola, J. J., Byrne, M., & Disselshorst, R. (2015). Organizational involvement in employee health on work-related outcomes. In *Society for Industrial and Organizational Psychology Conference*. Philadelphia, PA.

de Bruijin, G.-J. (2011). Exercise habit strength, planning and the theory of planned behavior: An action control approach. *Psychology of Sport and Exercise, 12*, 106–114.

Delany, J. P., Kelley, D. E., Hames, K. C., Jakicic, J. M., & Goodpaster, B. H. (2014). Effect of physical activity on weight loss, energy expenditure, and energy intake during diet induced weight loss. *Obesity, 22*(2), 363–370. https://doi.org/10.1002/oby.20525.

Dimsdale, J. E. (2008). Psychological stress and cardiovascular disease. *Journal of the American College of Cardiology, 51*(13), 1237–1245.

Dishman, R. K., Oldenburg, B., Neal, H. O., & Shephard, R. J. (1998). Worksite physical activity interventions. *American Journal of Preventive Medicine, 15*(4), 344–361.

Dishman, R. K., Dejoy, D. M., Wilson, M. G., & Vandenberg, R. J. (2010). Move to improve a randomized workplace trial to increase physical activity. *American Journal of Preventive Medicine, 36*(2), 133–141. https://doi.org/10.1016/j.amepre.2008.09.038.

Donald, I., Taylor, P., Johnson, S., Cooper, C., Cartwright, S., & Robertson, S. (2005). Work environments, stress, and productivity: An examination using ASSET. *International Journal of Stress Management, 12*(4), 409–423. https://doi.org/10.1037/1072-5245.12.4.409.

Ducrot, P., Méjean, C., Aroumougame, V., Ibanez, G., Allès, B., Kesse-guyot, E., … Péneau, S. (2017). Meal planning is associated with food variety, diet quality and body weight status in a large sample of French adults. *International Journal of Behavioral Nutrition and Physical Activity, 14*, 12–14. https://doi.org/10.1186/s12966-017-0461-7.

Emmons, K. M., Linnan, L. A., Shadel, W. G., Marcus, B., & Abrams, D. B. (1999). The working healthy project: a worksite health-promotion trial targeting physical activity, diet, and smoking. *Journal of Occupational and Environmental Medicine, 41*(7), 545–555. https://doi.org/10.1097/00043764-199907000-00003.

Eyler, A. A., & Vest, J. R. (2002). Environmental and policy factors related to physical activity in rural white women. *Women & Health, 36*(2), 109–119. https://doi.org/10.1300/J013v36n02_08.

Fried, Y., Laurence, G. A., Shirom, A., Melamed, S., & Toker, S. (2013). The relationship between job enrichment and abdominal obesity: A longitudinal field study of apparently healthy individuals. *Journal of Occupational Health Psychology, 18*(4), 458–468. https://doi.org/10.1037/a0033730.

Gebhardt, D. L., & Crump, C. E. (1990). Employee fitness & wellness programs in the workplace. *American Psychologist, 45*(2), 262–272.

Goetzel, R. Z., & Ozminkowski, R. J. (2008). The health and cost benefits of work site programs. *The Annual Review of Public Health, 29*, 303–323. https://doi.org/10.1146/annurev.publhealth.29.020907.090930.

Hall, K. D., Sacks, G., Chandramohan, D., Chow, C. C., Wang, Y. C., Gortmaker, S. L., & Swinburn, B. A. (2011). Quantification of the effect of energy imbalance on bodyweight. *Lancet, 378*(9793), 826–837.

Harden, A., Peersman, G., Oliver, S., Mauthner, M., & Oakley, A. (1999). A systematic review of the effectiveness of health promotion interventions in the workplace. *Occupational Medicine, 49*(8), 540–548.

Hearn, D., Schuh-Renner, A., Canham-Chervak, M., Urli Hodges, E., & Evarts, L. (2018). Barriers to Physical Activity Among Military Hospital Employees. U.S. Army Medical Department Journal, 76–82. Retrieved from https://search-ebscohost-com.proxy108.nclive.org/login.aspx?direct=true&db=aph&AN=131385921&site=ehost-live&scope=site. Accessed 4 Oct 2018

Heesch, K. C., Brown, D. R., & Blanton, C. J. (2000). Perceived barriers to exercise and stage of exercise adoption in older women of different racial/ethnic groups. *Women and Health, 30*(4), 61–76.

Humpel, N., Owen, N., & Leslie, E. (2002). Environmental factors associated with adults' participation in physical activity: A review. *American Journal of Preventive Medicine, 22*(3), 188–199. https://doi.org/10.1016/S0749-3797(01)00426-3.

Jaffee, L., Lutter, J. M., Rex, J., Hawkes, C., & Bucaccio, P. (1999). Incentives and barriers to physical activity for working women. *American Journal of Health Promotion, 13*(4), 215–218.

Jeffrey, R. W., French, S. A., Raether, C., & Baxter, J. E. (1994). An environmental intervention to increase fruit and salad purchases in a cafeteria. *Preventive Medicine, 23*(6), 788–792.

Kahn-Marshall, J. L., & Gallant, M. P. (2012). Making healthy behaviors the easy choice for employees. *Health Education & Behavior, 39*(6), 752–776. https://doi.org/10.1177/1090198111434153.

Kaleta, D., & Jegier, A. (2005). Occupational energy expenditure and leisure-time physical activity. *International Journal of Occupational Medicine and Environmental Health, 18*(4), 351–356.

Kottwitz, M. U., Grebner, S., Semmer, N. K., Tschan, F., & Elfering, A. (2014). Social stress at work and change in women's body weight. *Industrial Health, 52*, 163–171.

Kreuter, M., Farrell, D., Olevitch, L., & Brennan, L. (2000). *Tailoring health messages: Customizing communication with computer technology*. Mahwah: Lawrence Erlbaum Associates.

Lappalainen, R., Saba, A., Holm, L., Mykkanen, H., & Gibney, M. J. (1997). Difficulties in trying to eat healthier: Descriptive analysis of perceived barriers for healthy eating. *European Journal of Clinical Nutrition, 51*(S2), S36–S40.

Lavie, C. J., Milani, R. V., & Ventura, H. O. (2009). Obesity and cardiovascular disease. Risk factor, paradox, and impact of weight loss. *Journal of the American College of Cardiology, 53*(21), 1925–1932. https://doi.org/10.1016/j.jacc.2008.12.068.

Mailey, E. L., Huberty, J., Dinkel, D., & Mcauley, E. (2014). Physical activity barriers and facilitators among working mothers and fathers. *BMC Public Health, 14*, 1–9.

Markey, C. N., August, K. J., Bailey, L. C., Markey, P. M., & Nave, C. S. (2016). The pivotal role of psychology in a comprehensive theory of obesity. *Health Psychology Open, 3*(1), 2055102916634365. https://doi.org/10.1177/2055102916634365.

Marks, D. F., Murray, M., & Estacio, E. V. (2018). *Health Psychology: Theory, research and practice* (5th ed.). Thousand Oaks: Sage Publications Ltd..

Mastellos, N., Gunn, L. H., Felix, L. M., Car, J., & Majeed, A. (2014). Transtheoretical model stages of change for dietary and physical exercise modification in weight loss management for overweight and obese adults. *Cochrane Database of Systematic Reviews, 2*, CD008066. https://doi.org/10.1002/14651858.cd008066.pub3.

Mazzola, J. J., Moore, J. T., & Alexander, K. (2017). Is work keeping us from acting healthy? How workplace barriers and facilitators impact nutrition and exercise behaviors. *Stress and Health, 33*(5), 479–489. https://doi.org/10.1002/smi.2731.

McNeill, L. H., Wyrwich, K. W., Brownson, R. C., Clark, E. M., & Kreuter, M. W. (2006). Individual, social environmental, and physical environmental influences on physical activity among black and white adults: a structural equation analysis. *Annals of Behavioral Medicine, 31*(1), 36–44. https://doi.org/10.1207/s15324796abm3101_7.

Mokdad, A. H., Ford, E. S., Bowman, B. A., Dietz, W. H., Vinicor, F., Bales, V. S., & Marks, J. S. (2003). Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. *Journal of the American Medical Association, 289*(1), 76–79.

Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *Journal of the American Medical Association, 291*(10), 1238. https://doi.org/10.1001/jama.291.10.1238.

National Institue for Health. (2017). Overweight & Obesity Statistics. Retrieved from https://www.niddk.nih.gov/health-information/health-statistics/overweight-obesity

Nestle, M., Wing, R., Birch, L., DiSorga, L., Drewnowski, A., Middleton, S. … Economos, C. (1998). Behavioral and social influences on food choice. *Nutrition Reviews, 56*(5), S50-S64.

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., … Yatsuya, H. (2014). Global , regional , and national prevalence of overweight and obesity in children and adults during 1980–2013: A systematic analysis for the Global Burden of Disease Study 2013. *Lancet, 384*, 766–781. https://doi.org/10.1016/S0140-6736(14)60460-8.

Nicholls, R., Perry, L., Duffield, C., Gallagher, R., & Pierce, H. (2017). Barriers and facilitators to healthy eating for nurses in the workplace: An integrative review. *Journal of Advanced Nursing, 73*(5), 1051–1065. https://doi.org/10.1111/jan.13185.

Nies, M. A., Vollman, M., & Cook, T. (1996). African American women's experiences with physical activity in their daily lives. *Public Health Nursing, 16*(1), 23–31.

Nixon, A. E., Mazzola, J. J., Bauer, J., Krueger, J. R., & Spector, P. E. (2011). Can work make you sick ? A meta-analysis of the relationships between job stressors and physical symptoms. *Work and Stress, 25*(1), 1–22. https://doi.org/10.1080/02678373.2011.569175.

Oenema, A., Brug, J., & Lechner, L. (2001). Web-based tailored nutrition education: Results of a randomized controlled trial. *Health Education Research, 16*(6), 647–660. https://doi.org/10.1093/her/16.6.647.

Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2012). Prevalence of Obesity in the United States, 2009–2010. *NCHS Data Brief, 82*, 1–8.

Payne, N., Jones, F., & Harris, P. R. (2010). A daily diary investigation of the impact of work stress on exercise intention realisation: Can planning overcome the disruptive influence of work? *Psychology and Health, 25*(1), 111–129. https://doi.org/10.1080/08870440903337622.

Pelletier, K. R. (2001). A review and analysis of the clinical- and cost-effective studies of comprehensive health promotion and disease management programs at the worksite: 1998-2000 update. *American Journal of Health Promotion, 16*(2), 107–116.

Pridgeon, A., & Whitehead, K. (2013). A qualitative study to investigate the drivers and barriers to healthy eating in two public sector workplaces. *Journal of Human Nutrition and Dietetics, 26*, 85–95. https://doi.org/10.1111/j.1365-277X.2012.01281.x.

Rhodes, R. E., & Plotnikoff, R. C. (2006). Understanding action control: Predicting physical activity intention-behavior profiles across six months in a Canadian sample. *Health Psychology, 25*(3), 292–299.

Rojon, C., McDowall, A., & Saunders, M. N. K. (2011). On the experience of conducting a systematic review in industrial, work, and organizational psychology. *Journal of Personnel Psychology, 10*(3), 133–138.

Romieu, I., Dossus, L., Barquera, S., Blottière, H. M., Franks, P. W., Gunter, M., … Willett, W. C. (2017). Energy balance and obesity: What are the main drivers? *Cancer Causes and Control, 28*(3), 247–258. https://doi.org/10.1007/s10552-017-0869-z.

Salmon, J., Owen, N., Crawford, D., Bauman, A., & Sallis, J. F. (2003). Physical activity and dedentary behavior : A population-based study of barriers, enjoyment, and preference. *Health Psychology, 22*(2), 178–188. https://doi.org/10.1037/0278-6133.22.2.178.

Schwetschenau, H. M., O'Brien, W. H., Cunningham, C. J. L., Jex, S. M. (2008). Barriers to physical activity in an on-site corporate fitness center. *Journal of Occupational Health Psychology, 13*(4), 371–380

Shrestha, A., Pyakurel, P., Shrestha, A., Gautam, R., Manandhar, N., Rhodes, E., Tamrakar, D., Karmacharya, B., Malik, V., Mattie, J., & Spiegelman, D. (2017). Facilitators and barriers to healthy eating in a worksite cafeteria: a qualitative study from Nepal. *Heart Asia, 9*(2), 1–7. https://doi.org/10.1136/heartasia-2017-010956.

Siegrist, J. (2002). Effort-reward imbalance at work and health. In P. L. Perrewé & D. C. Ganster (Eds.), *Research in occupational stress and well-being: Vol. 2. Historical and current perspectives on stress and health* (pp. 261–291). New York: Elsevier Science/JAI Press.

Sonnentag, S., & Jelden, S. (2009). Job stressors and the pursuit of sport activities: A day-level perspective. *Journal of Occupational Health Psychology, 14*, 165–181.

Stankevitz, K., Dement, J., Schoenfisch, A., Joyner, J., Clancy, S. M., Stroo, M., & Østbye, T. (2017). Perceived barriers to healthy eating and physical activity among participants in a workplace obesity intervention. *Journal of Occupational and Environmental Medicine, 59*(8), 746–751. https://doi.org/10.1097/JOM.0000000000001092.

Stokols, D. (1996). Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion, 10*(4), 282–298. https://doi.org/10.4278/0890-1171-10.4.282.

Taylor, W. C., Shegog, R., Chen, V., Rempel, D. M., Baun, M. P., Bush, C. L., … Hare-Everline, N. (2010). The booster break program: Description and feasibility test of a worksite physical activity daily practice. *Work, 37*, 433–443. https://doi.org/10.3233/WOR-2010-1097.

Tessaro, I., Campbell, M., Benedict, S., Kelsey, K., Heisler-MacKinnon, J., Belton, L., & DeVellis, B. (1998). Developing a worksite health promotion intervention: Health works for women. *American Journal of Health Behavior, 22*(6), 434.

Thum, J. S., Parsons, G., Whittle, T., & Astorino, T. A. (2017). High-intensity interval training elicits higher enjoyment than moderate intensity continuous exercise. *PLoS One, 12*(1), 1–11. https://doi.org/10.1371/journal.pone.0166299.

Ungar, N., Wiskemann, J., Sieverding, M. (2016). Physical activity enjoyment and self-efficacy as predictors of cancer patients' physical activity level. *Frontiers in Psychology, 7*. Retrieved from https://search-ebscohost-com.proxy108.nclive.org/login.aspx?direct=true&db=psyh&AN=2016-32698-001&site=ehost-live&scope=site. Accessed 5 Nov 2018.

Usual Dietary Intakes: Food Intakes, U.S. Population, 2007–2010. (2013). Retrieved from http://epi.grants.cancer.gov/diet/usualintakes/pop/2007-10/. Accessed 4 Oct 2018.

Warburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Review health benefits of physical activity: The evidence. *CMAJ, 174*(6), 801–809.

Wardle, J., Steptoe, A., Oliver, G., & Lipsey, Z. (2000). Stress, dietary restraint and food intake. *Journal of Psychosomatic Research, 48*, 195–202.

Watts, A. W., & Mâsse, L. C. (2013). Is access to workplace amenities associated with leisure-time? *Qualitative Research, 104*(1), e87–e91.

Wilborn, C., Beckham, J., Campbell, B., Harvey, T., Galbreath, M., La Bounty, P., … Kreider, R. (2005). Obesity: Prevalence, theories, medical vonsequences, management, and research directions. *Journal of the International Society of Sports Nutrition., 2*(2), 4–31. https://doi.org/10.1186/1550-2783-2-2-4.

Wolin, K. Y., Carson, K., & Colditz, G. A. (2010). Obesity and cancer. *The Oncologist, 15*(6), 556–565. https://doi.org/10.1634/theoncologist.2009-0285.

World Health Organization. (1999). Health living: What is a healthy lifestyle? Retrieved from http://apps.who.int/iris/handle/10665/108180.

Wright, J. D., Donley, A. M., Gualtieri, M. C., Strickhouser, S. M., & Wright, J. D. (2016). Food deserts: What is the problem? What is the solution? *Social Science and Public Policy, 53*, 171–181. https://doi.org/10.1007/s12115-016-9993-8.

Wynd, C. A., & Ryan-Wenger, N. A. (2004). Factors predicting health behaviors among army reserve, active duty army, and civilian hospital employees. *Military Medicine, 169*(12), 942–947.

Zunker, C., Cox, T. L., Wingo, B. C., Knight, B., Jefferson, W. K., & Ard, J. D. (2008). Using formative research to develop a worksite health promotion program for African American women. *Women & Health, 48*(2), 189–207. https://doi.org/10.1080/03630240802313514.