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Rationale for participation in JMU worksite wellness programs

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Rationale for Participation in JMU Worksite Wellness Programs

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Abstract

Effective employee wellness programs require an adequate understanding of the needs of employees. An employee wellness needs assessment was created to target the understanding of specific topics of interest, incentives and barriers to participation, and general health status of university employees. The majority (74.1%) of the 639 survey respondents (15.3% response rate) were female (age 45.7 ± 11.7 years), full-time employees. Employees were most interested in participating in programs involving physical activity, nutrition, and lifestyle wellness. Stages of change related to these topics include physical activity (pre-action: 42.3% and action: 44.7%), nutrition (pre-action: 37.4% and action: 42.2%), and work/life balance (pre-action: 44.9% and action: 23.9%). Flexible time off from work was the greatest incentive to participate while time, scheduling conflict, and location were the greatest barriers to participation. The majority of employees designated that they were in good health, of note, 33% of respondents were overweight and 22.7% were obese. Depressive disorders were the most commonly indicated diagnosed disorder, followed by high cholesterol, asthma, and high blood pressure. There were significant correlations between employees having been diagnosed with a specific health condition and their likelihood to participate in a corresponding program. For example, high blood pressure diagnosis was significantly associated with likelihood to participate in a blood pressure management program (Cramer's $V=0.407$, $p<0.01$). The same was true for high cholesterol and cholesterol management programs (Cramer's $V=0.355$, $p<0.01$), diabetes and diabetes management programs (Cramer's $V=0.492$, $p<0.01$), and depressive disorders and mental health programs (Cramer's $V=0.297$, $p<0.01$). A logistic regression model was used to determine factors associated

with past participation; 67.1% of past participation was predicted by 1) health status today versus 1 year ago, 2) use of UREC, 3) gender, 4) general health status, 5) physical activity frequency in the past month, 6) faculty or staff, 7) age. Although conducted prior to the Covid-19 pandemic, results indicate that 47.9% of employees were interested in participating in individual online programs and 49% demonstrated interest in self-directed programs. Tailoring programs to meet the needs of employees has the potential to significantly increase attendance and long-lasting positive benefits for employees.

Literature Review

Worksite wellness programs have been increasing in popularity over recent years. This is largely due to the growing obesity epidemic leading to development of chronic diseases including type 2 diabetes mellitus, cardiovascular disease, and others (Rodriguez-Hernandez & Wadsworth, 2019). Improving the health of employees has the potential to increase their physical wellbeing, limit the amount of sick leave and decrease health care costs. Additionally, it could lead to improvements in areas such as job satisfaction, productivity, and mental health. This leads into the discussion of what worksite wellness programs are and how they serve employees and employers. Understanding the foundation wellness can lead to the development and implementation of beneficial programs both for the employees and the employer.

A. Definition of wellness and broad design of programs

Worksite health promotion has been defined as "business-/industry-sponsored employee health promotion/education/safety programs (Michaels & Greene, 2013)." Wellness is multifaceted and covers many areas. Seven dimensions of wellness have been identified: physical, spiritual, emotional, occupational, intellectual, social, and environmental (Abbott & Baun, 2015). Additional dimensions of wellness to consider are financial, career, and creative wellness. As time progresses individuals may be more content with certain aspects of wellness in their lives than others, as wellness is not a stagnant state (Abbott & Baun, 2015). Progressing over time on the wellness spectrum and evolving is essential to remaining in a positive state of health. Mental health is another large component of wellness, one that is typically overlooked. However, mental

health awareness is becoming more commonly implemented in employee wellness programs (Wagner et al., 2016). The span of wellness is vast which can make it challenging for employers to create programs to meet the specific needs of individual employees.

Wellness program offerings will vary depending on the institution. Each program may choose to focus on different criteria of wellness. The most commonly cited wellness initiatives include improving on areas of physical, occupational, and intellectual health (Byrne et al., 2011; Kim et al., 2015; Lowensteyn et al., 2019; Rodriguez-Hernandez & Wadsworth, 2019; Ribeiro et al., 2014). However, more wellness programs are starting to adopt the implementation of mental health aspects and pay closer attention to employee satisfaction (Wagner et al., 2016). Mental health is equally as important to physical health in the workplace. Poor aspects of mental health can lead to diminished performance and increased absenteeism (Wagner et al., 2016). The workplace may seem like an inopportune location to assess mental health, and some individuals may be unwilling to address these issues at their place of work. However, worksite wellness programs that have included a mental health aspect have proved to be successful (Wagner et al., 2016). Using a mental health component in conjunction with physical activity have resulted in the most significant outcomes (Wagner et al., 2016). Although physical, occupational, intellectual, and mental health are the most commonly offered topics it does not mean they are the most desired topics by employees. For the purposes of this review of the literature, the four topics named above will be the most heavily discussed with primary focus on physical wellbeing and mental health.

As stated above, wellness is a broad term and understanding the concepts covered within the definition of wellness is essential to creating successful programs. It is important to keep in mind the 7-10 dimensions of wellness when developing programs. These topics will allow for a greater understanding of the person as a whole, rather than just a superficial look at the health of an individual (Abbott & Baun, 2015). Tools have been created to assess where individuals stand as it pertains to different concepts of wellness. Princeton University created a survey that asks several questions regarding each dimension of wellness (*Princeton UMatter wellness self-assessment*). Within the survey individuals are asked to score themselves on specific topics pertaining to wellness, this allows for self-evaluation and an understanding of areas that may be lacking (*Princeton UMatter wellness self-assessment*). Utilization of tools such as this one can provide guidance for individuals in further understanding areas of wellness they may be struggling with. Identifying which topics are of interest to the majority of individuals and which ones they would like to improve upon is essential to program development. Providing resources for topics that interest individuals will likely improve participation, retention rates, and increase desired results of the employees which in turn will benefit employers.

B. Historical context of worksite wellness programs

Worksite wellness interventions have expanded greatly over the years, developing from very simplistic interventions to complex operations covering a wide variety of topics. Initially, only larger corporations were able to offer some form of programming in the workplace. Companies that employ fewer than 50 individuals are significantly less

likely to have worksite wellness programs available to their staff when compared to larger companies (Larson-Meyer et al., 2018). However, now even small companies (those with at least 50 employees) have interventions in place at the worksite (Mattke et al., 2015). Data from a major employee wellness survey (RAND Workplace Wellness Program Study) found that about 50% of all smaller businesses and 90% of large businesses (>50,000 employees) offer worksite wellness programs (Mattke et al., 2015). This exemplifies the immense growth of programs over the years. Originally one of the major motivators to implementing worksite wellness programs from the perspective of employers was to reduce healthcare costs. More current research shows that although employees may be adopting healthier lifestyles, the costs associated with health care are not decreasing even when programs are offered (Mattke et al., 2015; Song & Baicker, 2019). That being said, only 20-40% of individuals who are eligible to participate in programs chose to do so (Mattke et al., 2015). This demonstrates the need to implement programs that individuals would actually participate in, essentially increasing program utilization leading to a potential reduction in health care costs.

Worksite wellness programs have transitioned over the years to meet the public health concerns. While originally a primary focus of a worksite wellness program may have been smoking cessation, current trends are transitioning to healthy eating and physical activity due to the growing rate of metabolic syndrome within the population. Data from NHANES (National Health and Nutrition Examination Survey) suggests that in 2012, 33% of the adult population (older than 20 years of age) had metabolic syndrome and 50% of adults over the age of 60 have been diagnosed with metabolic syndrome (Aguilar et al., 2015). Metabolic syndrome can be defined by a few different

criteria, but generally speaking it is the presence of three or more of the following: high waist circumference, elevated triglycerides, low high-density lipoprotein-cholesterol, hypertension, or elevated fasting blood glucose (Aguilar et al., 2015; Saklayen, 2018). Worksite wellness programs are now aimed to combat some of these issues. As public health concerns begin to shift, interventions found in wellness programming should also shift to accommodate these problems.

Worksite wellness programs have mainly been investigated in the corporate setting. There is a growing need to extend wellness programming outside of this environment. Universities are an ideal setting to promote employee health and wellness. Universities employ thousands of individuals. Thus, larger universities may have greater opportunity to provide more involved wellness programs to their employees. Smaller universities may not have the financial opportunity to provide the programming that larger schools do. This is similar to what has been recorded in corporate wellness programs as far as size of the corporation influencing means of wellness programs.

The research that has been published regarding employee wellness programs specifically at university settings is less than what is seen in corporate settings. However, there has been success at implementing programs at these settings. One of the largest concerns surrounding worksite wellness interventions, in any setting, is that once the initial program has been implemented employees lose interest and halt the progress that has been made or even regress after the conclusion of the initial intervention. Vanderbilt University has published research regarding a seven-year stepwise program that was implemented for their faculty and staff members (Byrne et al., 2011). Employees were

motivated to continue with programs due to the nature of the intervention (Byrne et al., 2011). The program was a "step-up" program, meaning that as time passed more components would be added to the intervention. In this particular program, the higher the tier or "step" the individual got to, the greater the incentive (Byrne et al., 2011). The study included several different topics, of which the greatest changes were seen in physical activity with a 10.7% increase over the 7-year period (Byrne et al., 2011). There were also improvements in nutrition (increasing fruit and vegetable intake by 4.4%), smoking rate (3% decrease), and seatbelt usage (7.9% increase) (Byrne et al., 2011). Over the 7-year period the obesity rate in Tennessee, where Vanderbilt University is located, increased by 4% however, those participating in the wellness program at Vanderbilt only had a 0.7% increase in obesity (Byrne et al., 2011). This study is not only a great example of the long-term impact that employee wellness programs can have but also that there can be significant improvements in health specific to a university setting.

C. **Benefits of participation in worksite wellness programs**

Worksite wellness programs have been found, in general, to be beneficial for participants. Benefits of wellness programs vary in range from weight loss, development of stress management skills, improved overall parameters of health, and others. Benefits are not exclusive to employees as employers and institutions can also benefit from the implementation of wellness programs. Improving productivity and increases in job attendance are examples of this (Hill-Mey et al., 2015). Health care costs may also be blunted with the implementation of worksite wellness programs, although not always

(Hill-Mey et al., 2015). The sections below will briefly address some of the more specific benefits for employees.

C.1 Health promotion

Worksite wellness programs are typically designed to encourage adoption of healthy behaviors. This is an extremely important topic as obesity and metabolic syndrome have become so prominent in society (Saklayen, 2018). Health promotion is a broad subject, which leads to a variety of topics when considering outcomes of wellness programs. Many studies have focused on the major topics of wellness and systematic reviews have been performed to broadly represent the data. Physical activity is a common health promotion strategy in worksite wellness, about 60% (8/13) of studies in a review demonstrated improvement in time spent participating in physical activity (Osilla et al., 2012). For example, one of the studies reviewed found that employees increased walking time by 103 minutes per week. Nutrition is another common topic, six of the twelve studies that were reviewed and maintained a nutrition component found improvements in participant nutrition, evidenced by an increased consumption of fruits and vegetables (about 1 serving per day) and decreased fat intake (Osilla et al., 2012). In addition to improved physical activity and healthy eating, BMI and other physiologic measures (blood pressure, cholesterol, etc.) have also decreased as a result of the wellness interventions (Osilla et al., 2012). There are many ways that worksite wellness programs can be beneficial for individuals, some may be through physical benefits while others may be through self-efficacy and individual empowerment (Kim et al., 2015; Osilla et al., 2012).

C.2 Sedentary behavior and chronic disease

Time participating in sedentary behavior is known to lead to the development of chronic disease (Rodriguez-Hernandez & Wadsworth, 2019). A meta-analysis indicated that 29% of type 2 diabetes mellitus could be avoided if sedentary TV viewing was removed from daily habits (Patterson et al., 2018). Distinguishing the difference between sedentary behavior and physical inactivity is important. Oftentimes these terms are used interchangeably, however they are not entirely the same. Being "sedentary" requires maintaining a certain body position (seated or reclined) and/or performing behaviors ≤1.5 metabolic equivalents (METS) but it does not include time spent sleeping (unless otherwise noted) (González et al., 2017). Physical inactivity is simply not meeting federal physical activity guidelines of 150 minutes of moderate to vigorous physical activity per week (González et al., 2017). When individuals spend large amounts of time in sedentary behavior (≥7 hours/day) their risk of all-cause mortality increases by 50% (Dunstan et al., 2012). In addition, this same level of sedentary behavior can double the risk of death from cardiovascular disease (Dunstan et al., 2012). The statistics presented above may seem extreme, as 7 hours per day may seem like an outlier, however research indicates that 51-68% of an individual's waking hours are spent in sedentary behavior, that is an average of 7.3-9.3 hours per day (Dunstan et al., 2012). In the US, individuals typically spend 55% of their day (7.7 hours) in sedentary behavior (Patterson et al., 2018). Increased risk of adverse health outcomes is associated with sitting for over 6-8 hours per day with 3-4 of those hours being spent watching tv, which is deemed as "the threshold for sitting" (Patterson et al., 2018).

Physical activity guidelines have been put in place to encourage healthy behavior by providing a framework to identify amounts of physical activity that should be performed, type of physical activity, and intensity of physical activity (Riebe et al., 2018). These guidelines which have been developed by the American College of Sports Medicine are used to provide recommendations in order to limit disease development. However, there are no specific guidelines regarding the amount of time spent in sedentary behavior, although dose dependent relationships are being investigated. Current guidelines for adults vaguely state that individuals "should move more and sit less throughout the day" (Riebe et al., 2018). Even if individuals are participating in physical activity and are meeting guidelines, they may still be spending copious amounts of time in sedentary behavior thus increasing their risk of disease development (Dunstan et al., 2012).

Increasing energy expenditure throughout the workday is beneficial to decreasing sedentary behavior, therefore reducing the risk of disease development or progression (Rodriguez-Hernandez & Wadsworth, 2019). Walking protocols are often used in worksite wellness interventions in an attempt to decrease sedentary behavior and increase time spent in physical activity. One frequent question surrounding physical activity, in this case walking, and health benefits is whether it should be done continuously or if it is better to distribute the activity throughout the day (Rodriguez-Hernandez & Wadsworth, 2019). This question was evaluated by comparing the effects on health as a result of continuous walking versus smaller bouts of walking. This protocol was designed around a 10-week intervention for sedentary office employees where the continuous walking group began the protocol walking for 20 minutes, 3 days per week and steadily increased

to 40 minutes, 5 days per week over the 10-week period. The multiple bouts group began the intervention with 4 bouts of walking per day for 5 minutes each bout, 3 days per week. This group steadily increased to walking 8 bouts of 5 minutes per day, 5 days per week. Each group progressed at the same rate, so they were walking the same number of minutes each day just in different intervals. Intensity was controlled using heart rate and rate of perceived exertion (Rodriguez-Hernandez & Wadsworth, 2019). Both walking groups, and the control group, showed improved body weight, fat mass, and body fat percentage (Rodriguez-Hernandez & Wadsworth, 2019). When compared to the continuous walking group, the intermittent group improved significantly on lean and fat free mass (Rodriguez-Hernandez & Wadsworth, 2019). There was no difference in physical activity intensity between the two groups. Another study found similar results when using a 100 day walking protocol in the workplace that utilized 3 short bouts of walking throughout the day (two, 10-minute bouts and one, 15-minute bout a day) when compared to a control group (Gu et al., 2020). It is important to note that the only nutritional aspect accounted for was alcohol, indicating that changes in diet may have impacted the results. Results from this study found improvements in body fat percentage (-1%), BMI (-0.5 kg/m^2), waist circumference (-2.3 cm) and systolic blood pressure (-2.1 mmHg) (Gu et al., 2020). Research of this nature is imperative to indicate that workplace wellness programs do play a role in benefiting health parameters and indicate that shorter frequent bouts of walking throughout the day are equally as effective as longer bouts. It is essential that worksite wellness programs strive to decrease sedentary behavior, which will aid in decreasing development of disease.

C.3 Mental health

Mental health concerns in the workplace have been gaining interest. Poor mental health outcomes as it pertains to worksites can lead to lower productivity, increased absenteeism, and financial issues (Huang et al., 2015; Weber et al., 2019). Implementation of worksite wellness programs that include mental health promotion aspects have proven to be beneficial for individuals (Wagner et al., 2016). The World Health Organization (WHO) defines mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community." One study utilized a mindfulness-based intervention for 8 weeks that allowed participants to attend 2-hour meditation and mindfulness workshops once a week in the workplace during paid hours (Huang et al., 2015). These participants had been identified as potentially suffering from some aspect of mental illness through questionnaire analysis. This intervention proved to be beneficial in improving psychological distress, prolonged fatigue, and perceived stress although it was not effective in improving job strain (Huang et al., 2015). Aspects of mental health typically investigated in worksite wellness programs include symptoms of depression, anxiety, fatigue, and or stress (Huang et al., 2015; Proper & van Oostrom, 2019). Incorporating aspects of mental health improvement initiatives into wellness programs in combination with other topics such as physical activity, have been proven to be the most effective (Wagner et al., 2016). One of the most effective ways to improve mental health in the workplace has been found to include e-health and cognitive behavior techniques (Proper & van Oostrom, 2019).

Utilizing advancing technology, such as mobile health applications, in the workplace could potentially provide a great avenue to promote health, specifically mental health. A group of researchers developed an app called “Kelaa” to be used specifically in the workplace as a preventative mental health intervention (Weber et al., 2019). This app utilizes 4 main methods of mental health interventions: diaries, guides for problem solving, training on relaxation techniques, and sensory measurement to track problems with associated behavior (Weber et al., 2019). To understand the effectiveness of the app, researchers utilized an intervention group who had access to the app (*n*= 210) and a control group who would have access to the app after the initial 4-week intervention (*n*=322) (Weber et al., 2019). Through the use of two modules, tracking and intervention, the app was able to beneficially influence stress levels, perception of wellness, and actual sleep pattern (Weber et al., 2019). They also found a dose dependent relationship between the amount of time an individual used the app and the level of significant impact the app made on the participants mental health. Overall, this study aligns with others demonstrating the benefits of utilizing mental health strategies in the workplace (Weber et al., 2019).

D. Other common intervention topics and strategies

The umbrella topic of wellness interventions is very broad which makes it difficult to compare programs directly. All programs are created uniquely different, while still implementing many of the same general principles. Most programs utilize more than one intervention strategy at a time, with the hopes of achieving a benefit for the employee and /or employer. For many years now, pedometer-based interventions have been very

common and have evolved with the evolution of wearable technology. The goal of these types of interventions is really to promote physical activity, with or without exercise. It is important to distinguish the difference between physical activity and exercise. Physical activity is defined as movement that requires energy expenditure, above the 1.5 METS threshold mentioned beforehand for sedentary behavior, but may not be intentional or structured, like walking to a car from an office or climbing a flight of stairs (Riebe et al., 2018). Exercise on the other hand is a form of structured activity to promote energy expenditure (Riebe et al., 2018).

Programs utilize behavior change strategies to increase health promotion (Michie et al., 2009; Miller, 2019). Self-monitoring has been one of the most effective behavior change strategies utilized in regard to employee wellness programs (Michie et al., 2009). Depending on the strategy utilized, social support may be a benefit of worksite wellness interventions (Ribeiro et al., 2014). The strategies utilized are often dependent on how employers think their employees would be the most motivated to participate, whether that be through incentives, gamification methods, or others (Lowensteyn et al., 2019; Mason et al., 2018). Increasing general knowledge of health benefits of the employees can act as an internal motivator to improve overall health.

An example of a program that used multiple strategies during their interventions is discussed below. A 6-week pedometer based worksite wellness intervention at the University of Kentucky utilized incentives to entice participants to meet a 10,000 step/day goal (Mason et al., 2018). The greatest monetary incentive was given after reaching 10,000 steps, however, smaller monetary gifts were given for below 10,000

steps. The closer the participants got to 10,000 steps, the higher the monetary prize. This intervention also had a social-online component that allowed participants to compare their step counts to those of other participants, which served as an external motivator but additionally plays into the gamification aspect which will be discussed below. Only 12.2% of the 2,206 participants met the goal of 10,000 steps; however, step count as a whole did increase over the course of the intervention. Unfortunately, after only a 1 week follow up, step counts had decreased by 8% even though the incentive was still being offered (Mason et al., 2018). This exemplifies why it is so important to also focus on improving behavior change internally, in addition to having an initial external motivator. To summarize, this intervention utilized pedometers, incentives, and an external motivator.

Gamification, mentioned briefly before, utilizes games and challenges to promote physical activity, nutrition, mental health, and other areas of wellness (Lowensteyn et al., 2019). Although gamification is not the most commonly used method it has been proven to be effective in some studies, improving clinical measures associated with health (Lowensteyn et al., 2019). One gamification program specifically used an online platform method over a 2-year time period to investigate if gamification strategies improved health outcomes in full time employees (n=571 at baseline) (Lowensteyn et al., 2019). The ratio of total cholesterol to HDL decreased by 0.14 and systolic blood pressure decreased 1.3 mmHg. In addition, fatigue based on the insomnia index decreased 1.1 MFI, and physical activity increased by 264 METs per week (Lowensteyn et al., 2019). The nature of the protocol allowed for long term intervention and follow up, aiding in changes to behavior modification and eventual adoption. One of the most important things to note about this

study and the method used (gamification) is that it yielded positive results without the use of incentives, which could be vital for workplaces without the financial means to spend large amounts of money on worksite health promotion (Lowensteyn et al., 2019).

As demonstrated above, programs will typically include multiple components/strategies. Counseling is typically a complementary component of worksite wellness interventions (Kim et al., 2015; Ribeiro et al., 2014; Song & Baicker, 2019). These counseling sessions can be group or individual sessions. One study investigated the impact counseling may have on step count in a pedometer-based intervention. After it was clear that counseling could positively influence step count the question then shifted to the best form of counseling, group or individual (Ribeiro et al., 2014). The study found that both counseling groups (individual and group) were able to improve step count per day, but the group counseling intervention demonstrated a greater benefit by increasing their total number of steps by 1,475 steps after 3 months compared to the individual counseling group who increasing their total step count by 512 steps after 3 months (Ribeiro et al., 2014). This was attributed to the group environment. Motivation and accountability are aspects that are oftentimes included in worksite wellness interventions, typically accomplished through goal setting and self-monitoring (Barleen et al., 2017; Gu et al., 2020; Lowensteyn et al., 2019). As technology continues to advance, wearable activity trackers are encouraged in order to aid in the self-monitoring process (Barleen et al., 2017; Gu et al., 2020). The use of goal setting in a group environment while self-monitoring with the use of a pedometer in a worksite wellness program was shown to be an effective way to increase physical activity in participants (Gu et al., 2020). Vigorous physical activity increased by 109.7 METs/week and walking increased by 209.2

METs/week during the intervention (Gu et al., 2020). Combining the use of self-monitoring, counseling, and incentives has demonstrated success.

E. Challenges of worksite wellness programs

There are many challenges to consider when designing a worksite wellness intervention. Needs vary based on corporation. That being said, needs can be vastly different even within one corporation. This is especially true at larger companies when age, salary, and positions vary, universities for example. One of the greatest challenges within worksite wellness interventions are attrition and adherence rates (Linke et al., 2011). On average, attrition rates typically fall within the 25-50% range (Linke et al., 2011). There are ways to improve upon these numbers, which will be discussed in the following section. Different implementation methods have been used to improve upon these results, but the core issue really stems from having a top down rather than a bottom up approach (Lupton, 1991). It is the administration that typically determines the needs of the employees and creates programs based on what they think the employees need. This idea typically revolves around managerial decisions but can be applied to this scenario as well (Lupton, 1991). Having a bottom up approach would allow the employees to build programs based on what they need and desire rather than what their employers think that they need. This could also increase recruitment and initial participation rates.

If programs are able to recruit individuals and attrition rates remain low, issues could still present from the population being recruited (i.e., recruitment/selection bias). For example, interest in physical activity programs is often greater in people that are already active or that are in good physical health. So, the challenge becomes recruiting

individuals who are less physically active or sedentary, and that are willing to make behavior changes (Thompson et al., 2005). Another recruitment / participation issue that should be addressed is diversity, equity and inclusion. Many times, employees of different backgrounds (i.e., ethnicity and socioeconomic status) do not feel programs are culturally appropriate (Thompson et al., 2005). Addressing this issue and making programs more culturally sensitive could contribute to closing the health gap for minority populations (Thompson et al., 2005).

One big issue with program design is that the majority are acute interventions. Meaning, once the program has been completed and the incentive has been awarded there is no motivation to continue with the program focus. This has been indicated by a dramatic fall in participation rates in long-term follow ups (Mason et al., 2018; Ribeiro et al., 2014). However, longer term interventions have found actual behavioral changes (Byrne et al., 2011). The study conducted at Vanderbilt University after seven years demonstrated that behavior change on topics such as physical activity, nutrition, alcohol consumption and others had occurred, transitioning from an initial external motivation (the incentive) to internal motivation (health/wellness) (Byrne et al., 2011). Similarly, incentivized programs may not be as effective for behavior change in the long term when the incentive or external motivator is removed (Mason et al., 2018). The inability to elicit internal behavior change negatively impacts long term adoption.

In addition to the traditional challenges observed in corporate settings, the university setting presents its own unique set of challenges. The reason that it is important to differentiate university settings from others is because some of the barriers

observed with typical fitness centers do not apply as closely at a university setting, such as cost and location ((Brown et al., 2014)). Typically, employees are able to use fitness facilities for no cost and since recreational centers are usually on or near campus, location is less of a barrier for most employees who work on those campuses, although still a concern for some university employees (Brown et al., 2014; Leininger et al., 2015). The wide range of jobs across a university campus (professors, administrators, food service workers, etc.) lead to a vast schedule differential (Leininger et al., 2015). In one study that was examining the barriers for specific positions on a university campus found that faculty members, who in this case were professors, cited that they typically utilized their own exercise programs and had more flexibility for off campus fitness, while staff members who had more rigid schedules did not have time to utilize any programs (Leininger et al., 2015). Employees often do not want to perform exercise around colleagues or students (Brown et al., 2014; Leininger et al., 2015). Being surrounded by a large majority of young people was also a concern, however it is important to note that this is a concern at most gym and fitness centers and is not exclusive to the university setting (Brown et al., 2014). Lack of equipment or times of group exercise classes that coordinated well with work schedules can be another barrier (Brown et al., 2014). Finally, whether family members could participate, and lack of childcare were also major concerns (Brown et al., 2014). Addressing these barriers would provide employees with a good outlet for physical activity and exercise promotion at university recreational facilities. Focusing on a range of topics that target specific university populations may be beneficial, as physical fitness is not the only component of health (Leininger et al., 2015).

For some individuals, programs with multiple and rigid working parts may be overwhelming, thus having adaptable and flexible programs could benefit the employees and consequently the employers (Miller, 2019; Thompson et al., 2005). For example, if employees are seeking less components, the company can save resources by not offering unwanted programs (Miller, 2019). Because programs vary so much and can be so complex it may be hard to assess them, as there is no standard program assessment model. However, an example of an assessment framework (RE-AIM) for program evaluation will be discussed in the following section.

F. Program assessment (RE-AIM)

The RE-AIM framework (reach, effectiveness, adoption, implementation, maintenance) allows programs to be evaluated in a consistent and standard way even when aims of programs are vastly different (Gaglio et al., 2013). The RE-AIM framework was created to be used in health promotion research, making it an ideal tool to evaluate worksite programs focused on employee health and wellness (Gaglio et al., 2013). Not every program is inclusive of all RE-AIM criteria; however, it is the strongest method used to keep program evaluation consistent in the field of employee health research (Gaglio et al., 2013). Breaking down each of these criteria to better understand how they pertain to worksite wellness interventions is essential and will give a better understanding of generalized use in employee wellness programs.

F.1 Reach

Reach refers back to individuals (target audience) who are eligible and willing to participate (Gaglio et al., 2013). The aim of worksite wellness programs is to promote adoption of healthy lifestyle habits for individuals in the workplace, however in order for this to be effective employees have to participate. The average participation rate in wellness programs offered at the workplace ranges from 20-50% (Person et al., 2010; Mattke et al., 2015). In order for employees to participate they first need to be aware of the programs available to them, as well as for the programs to be appealing. Determining the best platform to reach, for lack of a better word, employees can make a huge difference in participation rates. Poster and email contact are the most commonly cited methods of recruitment (Mason et al., 2018; Ribeiro et al., 2014). Participation in programs may be influenced by different motivators, the same way that participation may be hindered due to different barriers. The most common barriers to participation are as to be expected but are not limited to: "insufficient incentives, inconvenient locations, time limitations, not interested in topics presented, schedule, marketing, health beliefs, and not interested in the program (Person et al., 2010)". Acknowledging these barriers and others and finding ways to limit said barriers has the potential to alleviate the concern regarding lack of participation. There is no way to meet the needs of every employee in a population but providing options that suit a vast majority is essential to participation in programs. Minimizing barriers allows for a greater reach across employees and the potential to increase adherence allowing for greater success as it relates to health and wellness benefits.

Reach is also associated with retention. There are a vast number of reasons as to why individuals may choose to stop participating or decrease their adherence to program

protocols. Determining ways to lower attrition rates and increase adherence rates is valuable information for programs. It has been discovered that protocols that included some form of behavior change strategy elicited a lower attrition rate (Linke et al., 2011). Length of time of the protocol is something that must also be considered. The longer the protocol the greater the attrition rate (Linke et al., 2011; Norton et al., 2015). Decreasing attrition rates during long protocols can be aided by including elements of support and external motivators (Linke et al., 2011; Norton et al., 2015). In general, shorter protocols have shown to have a much smaller dropout rate (Norton et al., 2015). Some instances of attrition are "normal" in studies, especially in programs ranging from 8-24 weeks (Linke et al., 2011). However, because most wellness studies implement many different components it can be difficult to pinpoint exactly why attrition rates may be high or low. Intentions of individuals at the beginning of an implementation strategy may be positive, but as time progresses motivation begins to dwindle. Intention to change does not necessarily equate to behavior change, as many individuals have a set intention to change but do not make active behavior transformation (McDermott et al., 2016).

F.2 Effectiveness

Effectiveness is responsible for evaluating the results of the program, primarily looking at the main outcomes that were being examined (Gaglio et al., 2013). The amount of changes seen in participants are dependent on their baseline information (Merrill et al., 2011). Wellness programs have been found to be most effective for individuals who begin programs with a higher BMI, are sedentary, or in general have more "room for improvement" (Merrill et al., 2011). Effectivity of a program can be

difficult to assess because there is typically more than one outcome to be evaluated. Some components may have been effective while others were not, so the overall effectiveness of the program is compromised (Rodriguez-Hernandez & Wadsworth, 2019).

F.3 Adoption

Adoption utilizing the RE-AIM framework primarily refers to adoption at the setting/organization in which a program will be implemented (Gaglio et al., 2013). Adoption focuses on how the program will work at the institution (Gaglio et al., 2013). Additionally, adoption also refers to gaining the support of those who will actually be delivering the program or "intervention agents" (Glasgow et al. 2019). Both the setting and facilitators must be willing to implement the program. Adoption of wellness programs is one of the most challenging outcomes to create although among the most important. Gaining institution support to start programs is vital. For example, specific to this project, the university would need to be willing to adopt programming. Wellness program adoption at the university setting has been shown to be effective (Byrne et al., 2011). This is especially true as more research is surfacing surrounding building employee support by addressing needs thus improving program offerings specific to universities (Brown et al., 2014; Leininger et al., 2015).

F.4 Implementation

Implementation focuses on whether or not the components of the program were delivered as intended (Glasgow et al. 2019). It also takes into consideration how the

participants and clients utilize the strategies provided to them through the intervention (Glasgow et al. 2019). This is a really important consideration when programs have multiple components, including tiered interventions whether they be a stepped up or stepped down approach (Miller, 2019). Implementation methods are numerous and vary based on resources. Methods of implementation have been talked about at length and exemplify how many avenues are available surrounding employee wellness programs to promote healthy lifestyle habits and behavior change. Consistent implementation would mean that the entire protocol was delivered as intended but also that participants were actively utilizing all parts of the intervention. Program implementation is dependent on the needs of the population. Once the population demographic and available resources are taken into account, implementation methods can be combined to properly serve the employees with the anticipation that the program can be implemented in its entirety.

F.5 Maintenance

The maintenance piece is essential to employee wellness programs. It is used to determine if the intervention remained consistent for at least six months after the end of the protocol (Gaglio et al., 2013). Research indicates that using multiple behavior change theories, rather than a single theory, shows improved adoption of healthy lifestyles (McDermott et al., 2016). Long term maintenance of intervention components of programs can lead to overall improvements in health, even if it is only one or some of the many elements within the program. Although a six month follow up is the most common, if a follow up is done at all, longer follow ups are needed. Maintenance for up to a year following the cessation of a program would be ideal to understand the maintenance piece

and should be further investigated as employee health and wellness programs grow and evolve. Long term adoption is essential for employee success.

G. Current needs assessments

Currently, the CDC has provided an employee wellness survey for public use (CDC National Healthy Worksite Program (NHWP)). This survey is available for employers to use to assess the needs of their employees. However, the issue with using this source as it pertains to this investigation is that it is not specific to the university population. Some research has come out regarding needs assessment and interest surveys specific to university population (Leininger et al., 2015; Tapps et al., 2016). The results of these needs assessments focus on employee demographics, participation in physical activity, interests in specific program topics (physical activity, lifestyle, nutrition, etc.), participation in past programs, and barriers to participation in programs (Leininger et al., 2015; Tapps et al., 2016). The use of needs assessments can aid in leading to more tailored needs programs for employers to create for their employees.

H. Conclusion/summary

Worksite wellness programs can be an effective way to promote health and wellbeing in the workplace while instilling a sense of community. Wellness interventions can decrease the development of chronic disease and prevent the progression of preexisting conditions (Ribeiro et al., 2014). Examining and accounting for all factors related to wellness is essential in creating a program that is beneficial for employees as well as employers. For this reason, it is important to determine the needs of employees at

James Madison University. Our research team has created a survey that seeks to determine the underlying needs of JMU faculty and staff as it pertains to wellness. The results from the survey will unveil pertinent information regarding the needs of employees, motivation and barriers to participation so programs can be implemented successfully. Knowing what topics are of the greatest interest and what methods of implementation are most conducive to the population will allow for the most effective programs. but it will also be cost efficient for the university by ensuring resources are being used in an appropriate manner.

References

Abbott, R. A., & Baun, W. B. (2015). The multi-dimensions of wellness: The vital role of terms and meanings. *American Journal of Health Promotion: AJHP, 29*(5),TAHP8-10.

Aguilar, M., Bhuket, T., Torres, S., Liu, B., & Wong, R. J. (2015). Prevalence of the metabolic syndrome in the United States, 2003-2012. *Jama, 313*(19), 1973-1974. doi:10.1001/jama.2015.4260

Barleen, N. A., Marzec, M. L., Boerger, N. L., Moloney, D. P., Zimmerman, E. M., & Dobro, J. (2017). Outcome-based and participation-based wellness incentives. *Journal of Occupational and Environmental Medicine, 59*(3), 304-312. doi:10.1097/JOM.0000000000000965

Brown, T. C., Volberding, J. L., Baghurst, T., & Sellers, J. (2014). Faculty/staff perceptions of a free campus fitness facility. *International Journal of Workplace Health Management, 7*(3), 156-170. doi:10.1108/IJWHM-05-2013-0020

Byrne, D., Goetzel, R., McGown, P., Holmes, M., Beckowski, M., Tabrizi, M., . . . Yarbrough, M. (2011). Seven-year trends in employee health habits from a comprehensive workplace health promotion program at Vanderbilt university. *Journal of Occupational and Environmental Medicine, 53*(12), 1372-1381. doi:10.1097/JOM.0b013e318237a19c

CDC National Healthy Worksite Program (NHWP). *Employee health assessment (CAPTURE)*

Christensen, J. R., Pajevic, M., Ilvig, P. M., Søgaard, K., & Jessen-Winge, C. (2019). Why people engage in a weight loss intervention at their workplace - a stratified case study. *BMC Public Health, 19*(1), 1-8. doi:10.1186/s12889-018-6346-0

Dunstan, David W.|Howard, Bethany|Healy, Genevieve N.|Owen, Neville. (2012). Too much sitting – A health hazard. *Diabetes Research and Clinical Practice, 97*(3), 368-376. doi:10.1016/j.diabres.2012.05.020

Gaglio, B., Shoup, J. A., & Glasgow, R. E. (2013). The RE-AIM framework: A systematic review of use over time. *American Journal of Public Health, 103*(6), e38-e46. doi:10.2105/AJPH.2013.301299

Glasgow RE, Harden SM, Gaglio B, Rabin B, Smith ML, Porter GC, Ory MG and Estabrooks PA (2019) RE-AIM Planning and Evaluation Framework:

Adapting to New Science and Practice With a 20-Year Review. *Front. Public Health* 7:64. doi: 10.3389/fpubh.2019.00064

González, K., Fuentes, J., & Márquez, J. L. (2017). Physical inactivity, sedentary behavior and chronic diseases. *Korean Journal of Family Medicine, 38*(3), 111-115. doi:10.4082/kjfm.2017.38.3.111

Gu, M., Wang, Y., Shi, Y., Yu, J., Xu, J., Jia, Y., & Cheng, M. (2020). Impact of a group-based intervention program on physical activity and health-related outcomes in worksite settings. *BMC Public Health, 20*(1), 935. doi:10.1186/s12889-020-09036-2

Hill-Mey, P. E., Kumpfer, K. L., Merrill, R. M., Reel, J., Hyatt-Neville, B., & Richardson, G. E. (2015). Worksite health promotion programs in college settings. *Journal of Education and Health Promotion, 4*(1), 12. doi:10.4103/2277-9531.154019

Huang, S., Li, R., Huang, F., & Tang, F. (2015). The potential for mindfulness-based intervention in workplace mental health promotion: Results of a randomized controlled trial. *PloS One, 10*(9), e0138089. doi:10.1371/journal.pone.0138089

Kim, S. D., Hollensbe, E. C., Schwoerer, C. E., & Halbesleben, J. R. B. (2015a). Dynamics of a wellness program: A conservation of resources perspective. *Journal of Occupational Health Psychology, 20*(1), 62-71. doi:10.1037/a0037675

Larson-Meyer, D. E., Woolf, K., & Burke, L. (2018). Assessment of nutrient status in athletes and the need for supplementation. *International Journal of Sport Nutrition and Exercise Metabolism, 28*(2), 139-158. doi:10.1123/ijsnem.2017-0338

Leininger, L. J., Adams, K. J., & Debeliso, M. (2015). Differences in health promotion program participation, barriers and physical activity among faculty, staff and administration at a university worksite. *International Journal of Workplace Health Management.* 8(4): 246-255. doi:10.1108/IJWHM-10-2014-0045

Linke, S., Gallo, L., & Norman, G. (2011). Attrition and adherence rates of sustained vs. intermittent exercise interventions. *Annals of Behavioral Medicine, 42*(2), 197-209. doi:10.1007/s12160-011-9279-8

Lowensteyn, I., Berberian, V., Berger, C., Da Costa, D., Joseph, L., & Grover, S. A. (2019). The sustainability of a workplace wellness program that incorporates gamification principles: Participant engagement and health benefits after 2

years. *American Journal of Health Promotion,* , 89011711882316. doi:10.1177/0890117118823165

Lupton, T. T. (1991). Organisational change:″Top-down ″or “Bottom-up” management? *Personnel Review, 20*(3), 4; 4-10; 10.

Mason, M. R., Ickes, M. J., Campbell, M. S., & Bollinger, L. M. (2018). An incentivized, workplace physical activity intervention preferentially increases daily steps in inactive employees. *American Journal of Health Promotion, 32*(3), 638-645. doi:10.1177/0890117117723803

Mattke, S., Kapinos, K., Caloyeras, J. P., Taylor, E. A., Batorsky, B., Liu, H., . . . Newberry, S. (2015). Workplace wellness programs: Services offered, participation, and incentives. *Rand Health Quarterly, 5*(2), 7.

McDermott, M. S., Oliver, M., Iverson, D., & Sharma, R. (2016). Effective techniques for changing physical activity and healthy eating intentions and behaviour: A systematic review and meta-analysis. *British Journal of Health Psychology, 21*(4), 827-841. doi:10.1111/bjhp.12199

Merrill, R., Aldana, S., Garrett, J., & Ross, C. (2011). Effectiveness of a workplace wellness program for maintaining health and promoting healthy behaviors. *Journal of Occupational and Environmental Medicine, 53*(7), 782-787. doi:10.1097/JOM.0b013e318220c2f4

Michaels, C. N., & Greene, A. M. (2013). Worksite wellness: Increasing adoption of workplace health promotion programs. *Health Promotion Practice, 14*(4), 473-479. doi:10.1177/1524839913480800

Michie, S., Abraham, C., Whittington, C., McAteer, J., & Gupta, S. (2009). Effective techniques in healthy eating and physical activity interventions. *Health Psychology, 28*(6), 690-701. doi:10.1037/a0016136

Miller, C. (2019). Adaptive intervention designs to promote behavioral change in adults: What is the evidence? *Current Diabetes Reports, 19*(2), 1-9. doi:10.1007/s11892-019-1127-4

Norton, L.H., Norton, K.I., & Lewis, N.R. (2015). Adherence, compliance, and health risk factor changes following short-term physical activity interventions. *BioMed Research International, 2015*, 929782-9. doi:10.1155/2015/929782

Osilla, K. C., Van Busum, K., Schnyer, C., Larkin, J. W., Eibner, C., & Mattke, S. (2012a). Systematic review of the impact of worksite wellness programs. *The American Journal of Managed Care, 18*(2), 68.

Patterson, R., McNamara, E., Tainio, M., de Sá, T., Smith, A., Sharp, S., . . . Wijndaele, K. (2018). Sedentary behaviour and risk of all-cause, cardiovascular and cancer mortality, and incident type 2 diabetes: A systematic review and dose response meta-analysis. *European Journal of Epidemiology, 33*(9), 811-829. doi:10.1007/s10654-018-0380-1

Person, A.L., Colby, S.E., Bulova, J.A., & Eubanks, J.W. (2010). Barriers to participation in a worksite wellness program. *Nutrition Research and Practice, 4*(2), 149-154. doi:10.4162/nrp.2010.4.2.149

Princeton UMatter wellness self-assessment. Princeton University: UMatter. Retrieved from https://umatter.princeton.edu/sites/umatter/files/media/princeton-umatter-wellness-self-assessment.pdf

Proper, K. I., & van Oostrom, S. H. (2019). The effectiveness of workplace health promotion interventions on physical and mental health outcomes - a systematic review of reviews. *Scandinavian Journal of Work, Environment & Health, 45*(6), 546-559. doi:10.5271/sjweh.3833

Ribeiro, M., Martins, M., & Carvaino, C. R. (2014). Interventions to increase physical activity in middle-age women at the workplace: A randomized controlled trial. *Medicine & Science in Sports & Exercise, 46*(5), 1008-1015. doi:10.1249/MSS.0000000000000190

Riebe, D., Ehrman, J., Liguon, G., & Magae, M. (2018). *ACSM's guidelines for exercise testing and prescription* (2018th ed.). Philadelphia: Wolters Kluwer.

Rodriguez-Hernandez, M.G., & Wadsworth, D.W. (2019). The effect of 2 walking programs on aerobic fitness, body composition, and physical activity in sedentary office employees. *PLoS One, 14*(1), e0210447. doi:10.1371/journal.pone.0210447

Saklayen, M. (2018). The global epidemic of the metabolic syndrome. *Current Hypertension Reports, 20*(2), 1-8. doi:10.1007/s11906-018-0812-z

Song, Z., & Baicker, K. (2019). Effect of a workplace wellness program on employee health and economic outcomes: A randomized clinical trial. *Jama, 321*(15), 1491-1501. doi:10.1001/jama.2019.3307

Tapps, T., Symonds, M., & Baghurst, T. (2016). Assessing employee wellness needs at colleges and universities: A case study. *Cogent Social Sciences, 2*(1), 1250338. doi:10.1080/23311886.2016.1250338

Thompson, S. E., Smith, B. A., & Bybee, R. F. (2005). Factors influencing participation in worksite wellness programs among minority and underserved

populations. *Family & Community Health, 28*(3), 267-273. doi:10.1097/00003727-200507000-00007

Wagner, S. L., Koehn, C., White, M. I., Harder, H. G., Schultz, I. Z., Williams-Whitt, K., . . . Wright, M. D. (2016). Mental health interventions in the workplace and work outcomes: A best-evidence synthesis of systematic reviews. *The International Journal of Occupational and Environmental Medicine, 7*(1), 1-14. doi:10.15171/ijoem.2016.607

Weber, S., Lorenz, C., & Hemmings, N. (2019). Improving stress and positive mental health at work via an app-based intervention: A large-scale multi-center randomized control trial. *Frontiers in Psychology, 10*, 2745. doi:10.3389/fpsyg.2019.02745

Research Question and Objectives

Research Questions:

- Are JMU employees aware of wellness programs available to them, and if so, what encourages employees to participate in wellness programs or prevents them from participating?
- What would be the best way to meet the specific needs of employees through worksite wellness interventions?

Objectives:

1. Determine the reasons why JMU employees choose to participate or not participate in employee wellness programs.
2. Address specific needs of employees related to popular topics of interest while taking into consideration timing, location, and delivery methods of programs.
3. Understand the current general health status of JMU employees.

Manuscript

Abstract

Effective employee wellness programs require an adequate understanding of the needs of employees. An employee wellness needs assessment was created to target the understanding of specific topics of interest, incentives and barriers to participation, and general health status of university employees. The majority (74.1%) of the 639 survey respondents (15.3% response rate) were female (age 45.7 ± 11.7 years), full-time employees. Employees were most interested in participating in programs involving physical activity, nutrition, and lifestyle wellness. Stages of change related to these topics include physical activity (pre-action: 42.3% and action: 44.7%), nutrition (pre-action: 37.4% and action: 42.2%), and work/life balance (pre-action: 44.9% and action: 23.9%). Flexible time off from work was the greatest incentive to participate while time, scheduling conflict, and location were the greatest barriers to participation. The majority of employees designated that they were in good health, of note, 33% of respondents were overweight and 22.7% were obese. Depressive disorders were the most commonly indicated diagnosed disorder, followed by high cholesterol, asthma, and high blood pressure. There were significant correlations between employees having been diagnosed with a specific health condition and their likelihood to participate in a corresponding program. For example, high blood pressure diagnosis was significantly associated with likelihood to participate in a blood pressure management program (Cramer's $V=0.407$, $p<0.01$). The same was true for high cholesterol and cholesterol management programs (Cramer's $V=0.355$, $p<0.01$), diabetes and diabetes management programs (Cramer's $V=0.492$, $p<0.01$), and depressive disorders and mental health programs (Cramer's

V=0.297, p<0.01). A logistic regression model was used to determine factors associated with past participation; 67.1% of past participation was predicted by 1) health status today versus 1 year ago, 2) use of UREC, 3) gender, 4) general health status, 5) physical activity frequency in the past month, 6) faculty or staff, 7) age. Although conducted prior to the Covid-19 pandemic, results indicate that 47.9% of employees were interested in participating in individual online programs and 49% demonstrated interest in self-directed programs. Tailoring programs to meet the needs of employees has the potential to significantly increase attendance and long-lasting positive benefits for employees.

Introduction

Worksite wellness programs (WWP) have been implemented to improve the health of employees and increase the sense of community in the workplace (Michaels & Greene, 2013). WWP have the potential to impact an individual's physical, psychological, and spiritual health (Michaels Greene, 2013), and potentially improve employee productivity and attendance while decreasing health care costs (Hill-Mey et al., 2015). Most of these programs often focus on aspects surrounding physical wellbeing, which is essential as there is a growing rate of metabolic syndrome (obesity, hypertension, hypercholesteremia, high waist circumference and/or elevated blood glucose) in the United States (Aguilar et al., 2015). It is now estimated that 33% of the adult population over the age of 20 has metabolic syndrome (Aguilar et al., 2015). Additionally, WWP focusing on topics related to mental health are on the rise, especially as the prevalence of major depressive disorders are growing (Huang et al., 2015;

Lowensteyn et al., 2019; Weber et al., 2019). Approximately 8% of the US population is influenced by depression (Maurer et al., 2018).

During the initial stages of WWP, these were only offered at large institutions. However, now even smaller corporations are able to offer some form of WWP to their staff members (Mattke et al., 2015). WWP began in the corporate setting and have transitioned into the university setting. Universities employ many individuals in vast disciplines and have been successful in eliciting beneficial programming (Byrne et al., 2011). Past programs at universities have implemented topics such as physical activity, nutrition, and lifestyle habits (Byrne et al., 2011; Mason et al., 2018). Discovering which topics are most sought after by employees and the best way to implement those programs provides the opportunity to increase participation and significant benefits for employees and employers.

Employee wellness assessments are used in the corporate setting to better understand the needs of employees. The CDC has created a survey for public use that determines employee wellness needs, but it is not specific to the university population (CDC National Healthy Worksite Program (NHWP)). Additional needs assessments have been designed specifically for the university population (Leininger et al., 2015; Tapps et al., 2016). These surveys evaluate employee interest and concerns surrounding employee demographics, topics of the greatest interest to employees, limitations to participation, and others (Tapps et al., 2016). These surveys are university specific, making them difficult to use across various institutions. The aim of the current study was to design and distribute an employee wellness needs assessment to better understand what university employees at a large university (enrollment around 21,000 students) in Virginia were

seeking from WWP. Specific objectives were to examine what topics were of the greatest interest, how and when employees would like the programs to be administered, what incentives would increase participation as well as what would be the biggest barriers for employees to overcome in order to participate. Additionally, this project sought to gain a better understanding of the general health status of university employees and how it relates to WWP needs.

Methods

The "Faculty and Staff Wellness Program Interest Survey" was created for the targeted demographic of university employees. A review of available questionnaires and surveys related to wellness, WWP, and occupational health was conducted to determine if these would fit the objective of determining wellness needs of university employees. Given that the research team wanted to use one survey that would encompass the previously determined topics of interest (see Table 1), it was necessary to develop a new survey. Willingness to change lifestyle behaviors was assessed via a question from the CDC employee Health Assessment (CAPTURE^{TM}). The flow chart (Figure 1) outlines the general procedure. The survey was developed and reviewed by an interdisciplinary team from the Departments of Health Professions, Health Sciences, Mathematics and Statistics, and from the Balanced Dukes (JMU employee wellness program). This study was approved by JMU's IRB (#20-1203, appendix A).

Measures

The key measures (Table 1) assessed in the survey included demographics, awareness of program offerings, past participation in WWP, topics of interest, timing

needs, motivation for participation, preferred delivery method, barriers and incentives for participation. The survey concluded with optional questions surrounding health. The survey consisted of fixed response questions, Likert scale responses, drop down options, and free response questions. The fixed response questions were formatted in a multiple-choice style.

The complete survey is available in appendix B, but a brief description follows. After demographics were collected, respondents were asked: a) whether or not they were aware of WWP offered through the university; b) if they had participated in such programs; and c) how beneficial they considered the program to be. Participants were also asked about use of recreational facilities at the university (UREC) outside of structured WWP. Evaluation of topics of interest ranged from desire for specific screenings to general wellness topics for WWP. Fixed response questions were utilized to determine employee preference on duration, frequency, and preferred time of day to attend a WWP or workshop. Motivation for participation was investigated by inquiring about incentives, stages of change for lifestyle behaviors, perception of health, and certain medical conditions. Preferred delivery methods (in-person, online, group, individual, etc.) and barriers to participation were also evaluated. The optional questions at the end of the survey assessed topics such as perception of health, weight changes, sedentary behavior and current physical activity habits.

Survey quality assurance

The survey was reviewed by a statistician who specializes in survey analysis to ensure quality assurance. The survey was distributed to a small sample of employees

within the department of Health Professions at the university to test readability and comprehension of survey questions.

Survey distribution and sample characteristics

The survey was distributed to employees via university email and it was accessed using Qualtrics Survey Software. Informed consent was given prior to taking the survey and all responses were anonymous. Individuals were required to have internet access to participate since no hard copies were provided. Surveys were distributed to all part time and full-time university employees (no student workers). In order to increase response rate, survey recruitment emails were sent out on two different occasions separated by approximately one month. A 10% response rate was the desired outcome. Of the 4182 university employees that were invited to participate, 639 completed the survey (response rate: 15.3%). Of those who completed the survey 23.9% were male (average age 47.7 ± 12.25 years), 74.1% were female (45.7 ±11.69 years), and 2% chose not to disclose their gender. The time to complete the survey was not recorded, but it is estimated that it was less than 10 minutes

Statistical analysis

All analysis were performed using IBM SPSS Statistics (Version 26, Armonk, NY). Power calculations were carried out to ensure the number of responses would elicit statistical significance. Significance levels were set at $\alpha<0.05$. Surveys needed to be at least 70% complete in order to be analyzed. Descriptive statistics were used as the foundation to present the data. Chi square tests were performed to identify associations between variables of interest. Cramer's V and Eta^2 were run to determine the strength of

relationships between variables. A logistic regression model was also used to predict past participation by indicating specific variables via forward entry.

Table 1: General breakdown of the "Faculty and Staff Wellness Program Interest Survey"

Concepts	**Method of Assessment**	**Item on Survey**	**Item Description**
Demographics	Drop down box Fixed response	3, 4, 5, 6, 7, 8, *33, *34	-Age -Gender -Height -Weight -Full/Part time -Faculty/Staff -Weight compared to 1 year prior -Weight Stability
Awareness of programs	Fixed response	9, 10	-Awareness of current wellness programs -Communication about programs
Past participation	Fixed response Likert scale Free response	11, 12, 14, 25, 26, 28	-Past wellness program participation -Benefits of past programs -Satisfaction with past programs -General use of UREC -Use of specific services at UREC

Table 1 (continued): General breakdown of the "Faculty and Staff Wellness Program Interest Survey"

			-Use of a fitness membership outside of UREC
Topics of interest	Fixed response Free response	15, 16, 17	-General wellness topics of interest -Likelihood to participate in specific programs -Screenings of interest
Timing needs	Fixed response	13, 18, 19, 20	-Timing of past programs -Preferred time of day -Duration of program -Frequency of attendance
Motivation for participation	Likert scale Fixed response Free response	21, 29	-Stages of change -Incentives
Preferred delivery method	Fixed response Free response	22, 23	-Preferred platform -Program delivery method
Barriers to participation	Fixed response Free response	24, 27	-Barriers -Prevention of using UREC
Incentives	Fixed response Free response	29	-Stimulus to participate

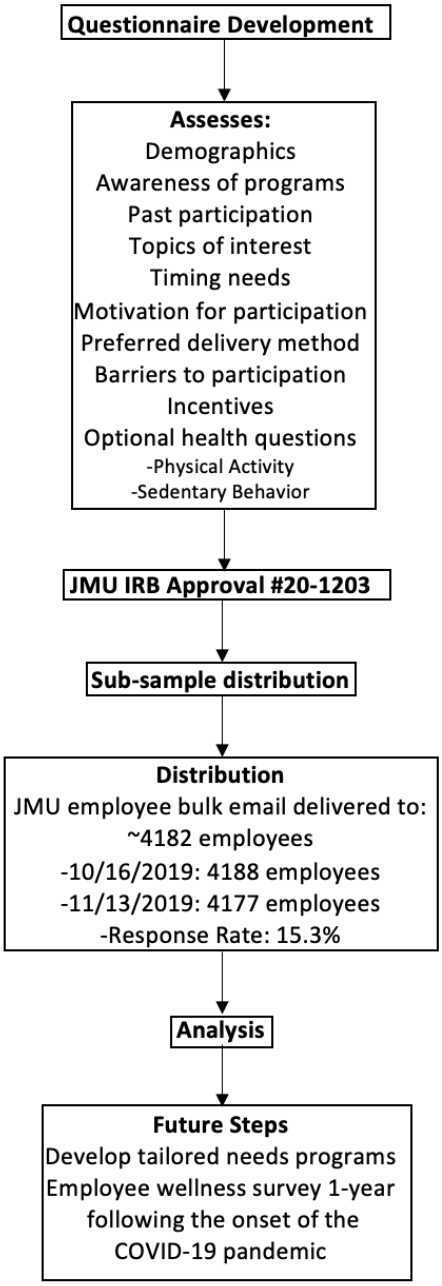
Table 1 (continued): General breakdown of the "Faculty and Staff Wellness Program Interest Survey"

Optional health questions	Likert scale Fixed Response Drop down	*31-43	
Overall health		31, 32, 35, 36	-Perception of health -Perception of health when compared to previous year -Diagnosed disorders -Medication
Sedentary behavior		37, 38, 39, 40	-Hours spent at work -Hours spent sitting at work -Total hours sitting -Sleep
Physical Activity Behavior		41, 42, 43	-Participation in physical activity -Instance of physical activity -Duration on physical activity

*Indicates that the question was asked under the optional survey questions

**Question 1 of the survey was the informed consent, question 2 was the definition of a wellness program, and question 30 was information surrounding the optional questions. These questions are not represented in the table.

Figure 1: Methods chart



Results

The survey was distributed on two separate occasions to 4,182 individuals that compose the university workforce, with an overall response rate of 15.3% (n=639). Table 2 presents the demographic breakdown of the survey respondents. The majority of respondents were female (74.1%), mostly full-time employees, with a fairly equal split between faculty and staff members. The average BMI for both genders was in the overweight category, but a larger percentage of females indicated being normal weight than males (40.4% and 26.5% respectively). Table 3 shows that most university employees (51%) rated their current health as "good", and about 55% indicated that their health status had not changed much when compared to the previous year.

Table 2: Demographic characteristics of respondents of the "Faculty and Staff Wellness Program Interest Survey"

Variable	**All (n=639)**	**Male (n=152)**	**Female (n=472)**	**Undisclosed (n=15)**
Age (years)	46.1 ± 11.8	47.7 ± 12.3	45.7 ± 11.7	39.5 ± 10.3
BMI (kg/m^2)	27.7 ± 6.2	28.2 ± 6.2	27.6 ± 6.6	26.2 ± 5.3
Underweight (%)	1.9	0.0	2.6	0.0
Normal weight (%)	37.2	26.5	40.4*	40.0
Overweight (%)	33.0	43.7	29.8*	40.0
Obese (%)	22.7	25.8	21.6	20.0
Morbidly obese (%)	5.2	4.0	5.6	0.0

Table 2 (continued): Demographic characteristics of respondents of the "Faculty and Staff Wellness Program Interest Survey"

Employment type (%)				
Faculty	47.6	55.9	44.5	53.8
Staff	52.4	44.1	55.5	46.2
Employment Status (%)				
Full time	88.7	91.4	88.1	76.9
Part time	11.3	8.6	11.9	23.1

Note: Data represent means ± standard deviation unless expressed otherwise.

*Significance ($p<0.05$) between BMI and gender for the specified category.

Table 3: General health status of JMU employees

Question	**All %**	**Female % (n=466)**	**Male % (n=148)**
How would you rate your health? (n=626)			
Poor	1.4	0.4	2.7
Fair	10.1	10.3	8.8
Average	23.3	23.2	24.3
Good	51.0	53.0	45.3
Excellent	14.2	13.1	16.9

Table 3 (continued): General health status of JMU employees

How would you rate your health compared to one year ago? (n=626)			
Much worse	0.3	0.0	1.4
Worse	14.9	13.9	17.6
About the same	55.6	56	54.7
Better	25.7	26.6	23.6
Much better	3.5	3.4	2.7

Approximately 3 out of 4 respondents were aware of WWP, of which 43% had participated in at least one program (Table 4). There were significant correlations between past program participation and the following variables: a) Gender (Cramer's $V=0.160$, $p<0.01$); b) being faculty or staff (Cramer's $V=0.152$, $p<0.01$); c) use of UREC (Cramer's $V=0.237$, $p<0.01$); d) current health rating (Cramer's $V=0.147$, $p=0.031$); e) current health compared to 1 year ago (Cramer's $V=0.195$, $p<0.01$). There was a significant correlation between past participation and BMI ($\eta=0.860$) where ~74% of the variation in past participation was explained by BMI. Other interval variables that were associated with past participation include: a) BMI change from a year ago ($\eta=0.962$); b) weight change from a year ago ($\eta=0.423$); c) age ($\eta=0.346$); d) monthly frequency of physical activity ($\eta=0.229$); e) total daily hours sitting ($\eta=0.212$), and f) hours spent sitting at work ($\eta=0.167$).

A stepwise forward logistic regression analysis including all the variables with significant associations to past participation in WWP revealed that the following model predicts past WWP participation by 67.1%: 1) Health status today versus 1 year ago, 2)

use of UREC, 3) gender, 4) current health status, 5) frequency of physical activity, 6) faculty or staff, and 7) age (Nagelkerke R^2=0.274). An overall percentage of 45.9% of employees who had participated in a WWP through the university were satisfied (very pleased or extremely pleased) with programs offered at JMU, while only 0.9% were not pleased.

About 15% of males and 6.4% of females designated that they are not interested in participating in WWP, however this percent was reduced to about 9% of males and 4% of females when the option of an incentive to participate was introduced. Contrastingly, a strong percentage of individuals would participate without an incentive (37.7%). In descending order, flexible time off from work (57.1%) was the most sought-after incentive, followed by financial reward (43.5%), obtaining personal health information (41.5%), and obtaining general health information (20.5%). There were no determined differences between gender and incentives to participate.

Table 4: Awareness, participation, and views on university wellness programs

Question	**Response Breakdown %**
Aware of wellness programs? (n=639)	
Yes	78.9
No	21.1
Are communications about wellness programs clear? (n=501)	
Yes	88.6
No	8.8

Table 4 (continued): Awareness, participation, and views on university wellness

I do not receive communications about wellness programs	2.6
Have you participated in wellness programs? (n=504)	
Yes	43.1
No	56.9
Are programs scheduled at times conducive to your schedule (n=503)	
Yes	10.1
No	17.3
Sometimes	61.8
Not sure	10.7
How pleased are you with the wellness programs at JMU (n=216, only those who had previously participated)	
Not pleased	0.9
Slightly pleased	18.5
Neutral	34.3
Very pleased	39.4
Extremely Pleased	6.5
Not interested	0.5

Barriers to program participation are listed in Table 5. The top 3 barriers to participation were time (86.2%), scheduling conflict (74.5%), and location of the workshop (52%). It's important to note that almost 1 out of 5 respondents mentioned confidentiality concerns as a reason for not participating. The barriers for using the

services offered at UREC include (male, female): 1) the facility was inconvenient (15.1%, 11%); 2) do not want to interact with students (13.2%, 13.3%), 3) the facility was typically crowded (11.2%, 10.4%); and 4) concerns over parking (9.2%, 11%).

On-campus workshops were the most requested delivery method for both men (47.4%) and women (69.1%). In-person group programs were also highly sought after, more so by women than men, 63.6% and 42.8% respectively. Individual online programs (47.9%) and self-directed programs (49%) were of interest by almost 50% of the respondents.

Table 5: Barriers for participation in university wellness programs

Barriers	**All* (%)**	**Female (%)**	**Male (%)**
Time	86.2	88.6	81.6**
Scheduling conflict	74.5	76.7	69.7
Location of workshop	52.0	54.9	43.4**
Motivation	30.0	29.7	33.6
Unaware of programs available	27.2	26.1	32.2
Confidentiality	19.2	18.9	19.1
Childcare needs	18.3	19.1	15.8
Separate work/personal life	11.0	9.1	15.8**

Table 5 (continued): Barriers for participation in university wellness programs

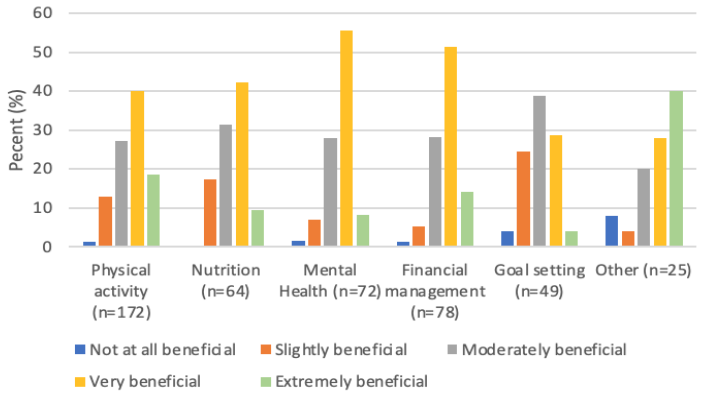
Inability for spouse to participate	9.9	9.5	11.2
Don't want to interact with colleagues	8.9	7.6	11.2
Lack of supervisor support	5.5	5.9	3.9
Physical disability	3.3	2.8	4.6

*Includes individuals (n=15) with undisclosed gender

**Significant ($p<0.05$) association between topics and gender

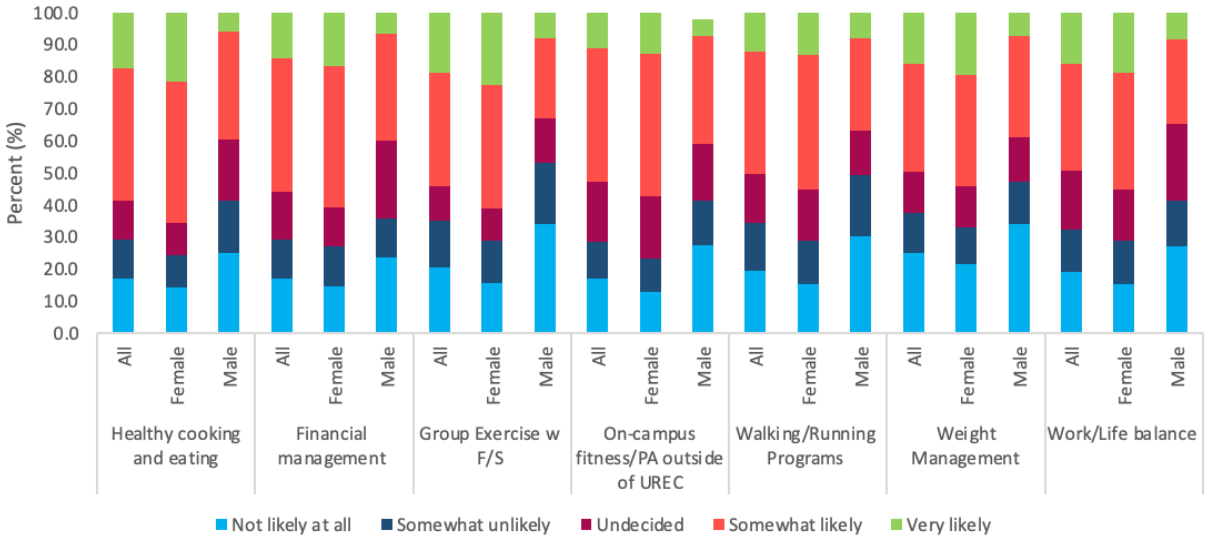
Figure 2 illustrates that all programs offered in the categories of physical activity, nutrition, mental health, financial management and goal setting elicited some benefit to the participant. Financial management programs were designated as the most beneficial, with 65.4% of respondents stating they found the program "very beneficial" or "extremely beneficial". Mental health programs (63.9%) and physical activity (58.7%) were also perceived as more than moderately beneficial. Goal setting was not found to be as favorable, with only 32.7% of individuals finding the program to be "very beneficial" or "extremely beneficial."

Figure 2: Perceived benefit of the wellness programs attended by all respondents



Physical activity (78.1%), nutrition (56.5%), and lifestyle wellness (50.2%) were the topics that demonstrated the greatest interest by employees. Figure 3 demonstrates the topics that employees are most likely to participate in. Healthy cooking and eating, financial management, and group exercise with faculty and staff members only were programs determined to be the most likely for employees to attend and were significantly associated with gender (all $p<0.01$). While 54% of employees who completed the survey noted being "very likely" or "somewhat likely" to attend group exercise classes with faculty and staff members, 63% indicated being "not at all likely" or "somewhat unlikely" to attend group exercise classes with the entire JMU community.

Figure 3: Likelihood to participate in wellness programs for all participants and by gender



The topics within figure 3 represent the seven topics that demonstrated the greatest likelihood for participation, in descending order from left to right. However, employees were asked to respond to their likelihood to participate in 19 total programs. The remaining 12 programs in descending order of likelihood to participate (somewhat likely + very likely) were: stress management (43.9%), emotional health (42.1%), sleep

(41.4%), mental health (40.2%), heart health (33%), men's/women's health (29.2%), group exercise with the entire JMU community (25.4%), cholesterol management (19.3%), blood pressure management (17.4%), diabetes management (10.5%), disability management (5.5%), and smoking cessation (1.5%). Regarding screening tests, the ones with the highest demand were body composition (56.0%), bone density (51.2%), fitness testing (49.8%), and cholesterol screening (48.5%). About 2/3 (63.7%) of the employees who completed the survey noted interest in receiving a flu shot if it was available to them.

The top 5 diagnosed disorders in the surveyed university employees are, in descending order: depressive disorder (22.2%), high cholesterol (17.8%), asthma (12.4%), high blood pressure (12.1%), and chronic low back pain (10.8%). Table 6 represents how diagnosed disorders were associated with likelihood to participate in specific topics, using Cramer's V. Physical activity programs were also investigated relating to diagnosed disorders. The only significant findings to note were high cholesterol and the likelihood to participate in on-campus physical activity outside of UREC (Cramer's V=0.126, p=0.040) and depressive disorders and likelihood to participate in group exercise with the entire JMU community (Cramer's V=0.135, p=0.022). Over 60% of employees indicated taking no medications, while 11.3% stated taking medication for hypertension and 10% taking medication to control high cholesterol.

Table 6: Association between diagnosed disorders and likelihood to participate in wellness programs of selected topics

	Cramer's V	Significance
Heart Disease		
Healthy cooking and eating	0.071	0.531
Heart health	0.138	0.017*
Blood pressure management	0.075	0.472
High Blood Pressure		
Healthy cooking and eating	0.075	0.478
Heart health	0.131	0.029*
Blood pressure management	0.407	0.000*
High Cholesterol		
Healthy cooking and eating	0.135	0.022*
Heart health	0.164	0.002*
Cholesterol management	0.355	0.000*
Diabetes		
Healthy cooking and eating	0.098	0.201
Heart health	0.093	0.248
Diabetes management	0.492	0.000*
Depressive Disorder		
Healthy cooking and eating	0.112	0.098
Stress management	0.202	0.000*
Mental health	0.297	0.000*
Emotional health	0.270	0.000*

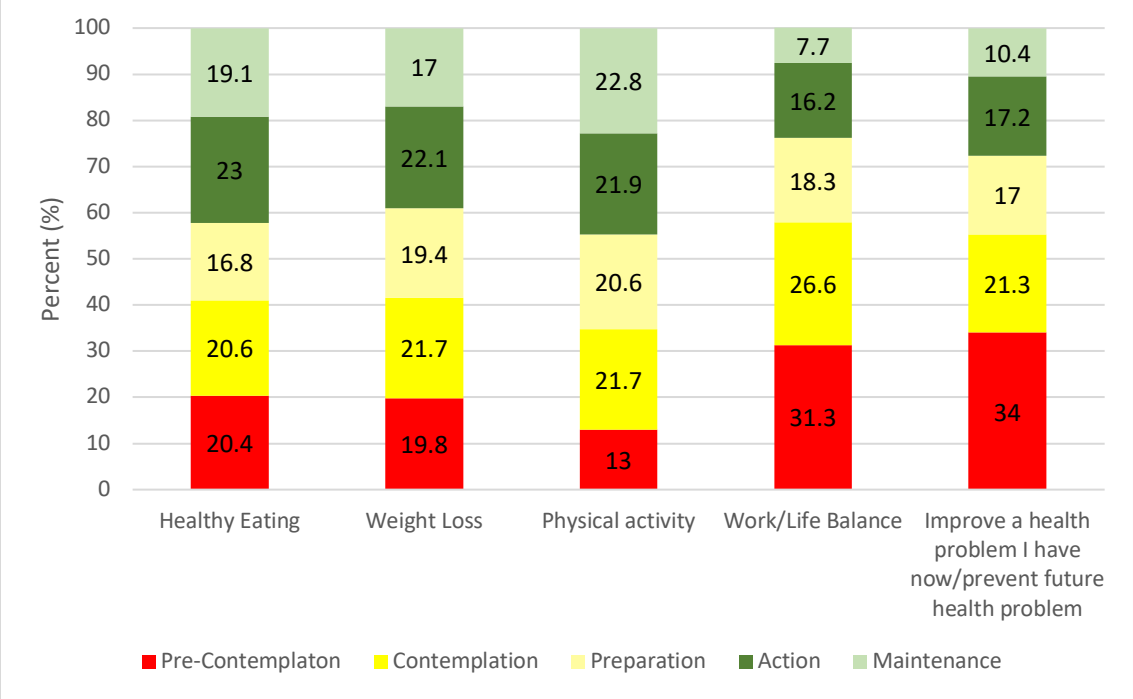
Work/life balance	0.049	0.831
Sleep	0.103	0.156
Men's/Women's health	0.113	0.026*

*indicates significance at $p<0.05$

Figure 4 demonstrates how employees feel regarding their willingness to make changes in certain criteria. Stages of change data was analyzed focusing primarily on the pre-action (contemplation and preparation) and action (action and maintenance) stages of change. Pre-action is indicated in yellow and action is indicated in green in Figure 4. This data was also explored to observe if there were significant associations between stages of change for specific topics and likelihood to participate in WWP of similar topics (e.g. healthy eating stage of change and how likely are you to participate in healthy cooking/eating workshops). The only thematic significant associations were for the pre-action and action phases of physical activity and group exercise with the entire JMU community (Cramer's V=0.169, p=0.003) and the pre-action and action phases of weight loss and on-campus physical activity outside of UREC (Cramer's V=0.141, p=0.035). Finally, associations between the pre-action and action phases of stages of change of specific topics and diagnosed disorders were investigated. The pre-action and action phases of improving a current health problem or preventing a future health problem was significantly associated with the diagnosed disorders heart disease (Cramer's V=0.116, p=0.022), diabetes (Cramer's V=0.101, p=0.045), and depressive disorders (Cramer's V=0.122, p=0.016). Additionally, the pre-action and action phases of healthy eating were significantly associated with a diagnosis of high blood pressure (Cramer's V=0.108, p=0.014). Lastly, the pre-action and action phases of weight loss were significantly associated with the diagnosis of high blood pressure (Cramer's V=0.088, p=0.046) and

diabetes (Cramer's V=0.098, p=0.026). Regarding alcohol and tobacco use, the majority of employees indicated being in the pre-contemplation phase, meaning that they are satisfied or have no desire to change (data not shown). Past participation and stages of change were also evaluated, where there were significant associations between stages of change under all topics, with the exception of tobacco use.

Figure 4: Stages of change of survey respondents regarding specific topics



Pre-contemplation: I am satisfied with the way I am now and have no desire to change.

Contemplation: I have considered making healthier choices.

Preparation: I have seriously considered making healthier choices and I am ready to make a change.

Action: I have started making healthier choices,

Maintenance: I have already made changes for a healthier lifestyle and I am trying to maintain them.

Discussion

The findings from the employee wellness survey which was completed by 15.3% of the faculty and staff at a large university in Virginia provided insight into the WWP needs and wants of higher education employees. It must be noted that this survey was conducted in October and November of 2019 prior to the onset of the Covid-19 pandemic. The vast majority of survey respondents were female (74%). There are findings that women are more likely to complete surveys than men (Lallukka, 2020). Additionally, university WWP have found women to participate at greater rates than men (65% in one study) (Beck et al., 2016).

NHANES has reported that the prevalence of obesity in US adults from 2017-2018 was 42.4% (Hales, 2020). Results of the current survey (using self-reported height and weight) indicate that prevalence of obesity in the JMU employee population is lower than the national prevalence, with 21.6% of females and 25.8% of males being classified as obese and 5.6% of females and 4% of males being classified as morbidly obese. A greater percentage of women were classified as having normal weight, 40.4% versus 26.5% of males. Some discussion has surfaced about baseline participant characteristics such as BMI influencing participation, and in addition influencing results (Merrill et al., 2011). There was a strong correlation between past participation and BMI in the present study. The majority of employees indicated that they were in good health and that their health status had not changed much over the course of a year. There was a strong association between diagnosed disorders and the employee's willingness to participate in related programs. For example, heart disease and programs related to heart health, high blood pressure and blood pressure management programs, diabetes and diabetes

management programs, and others. Mental health, particularly depression, was designated as the most prevalent diagnosed condition within respondents (22%).

Mental health components of WWP are becoming more common in the workplace (Huang et al., 2015; Lowensteyn et al., 2019; Weber et al., 2019). Often, this type of programming is used in conjunction with other aspects of wellness (Lowensteyn et al., 2019; Weber et al., 2019). While some may be hesitant to participate in mental health wellness programming at the workplace, over 40% of JMU employees indicated being interested in participating if these programs were offered. Specific to mental health, those who had been diagnosed with a depressive disorder showed a significant association in their likelihood to participate in topics such as stress management, mental health, emotional health, and men's/women's health.

Providing programming that is sought after and effective is essential to employee success (Miller, 2019). Offering highly desired programs will not only increase participation but has the potential to do so without reliance on incentives. Most WWP primarily focus on physical activity and nutrition, while potentially incorporating other wellness components (Byrne et al., 2011; Lowensteyn et al., 2019; Rodriguez-Hernandez & Wadsworth, 2019). Accordingly, physical activity and nutrition programming were the most sought after by JMU employees. However, one study indicated even greater interest in lifestyle wellness than nutrition and physical activity programs, exemplifying the importance of surveying the employee population to determine their needs (Tapps et al., 2016). Lifestyle wellness and financial management were also of immense interest to JMU employees. The majority of WWP offered at JMU were designated as very

beneficial to extremely beneficial with very few employees indicating they deemed a program they had participated in to be only slightly beneficial or not beneficial at all.

Topics of interest varied some between men and women. Overall, men were less likely to participate in any wellness program, regardless of topic. This is consistent with previous research (Beck et al., 2016). Men typically tend to participate more in programs that entail a physical activity component (Thompson et al., 2005). However, results of this study indicate that the program men were most likely to participate in was unrelated to physical activity, although those topics were still of interest. Men were most likely to participate in financial management, healthy cooking and eating, and on-campus physical activity outside of UREC. Women were most likely to participate in (in descending order): healthy cooking and eating, group exercise with faculty and staff members, and financial management programs. Men indicated being more resistant to participation in programs due to interactions with colleagues as 11.2% of men noted this to be a barrier to participation while only 7.6% of women designated similar concerns. Additionally, separating work and personal life was a greater priority for men (15.8%) than women (9.1%).

Examining topics of interest in this population in regard to their willingness to change certain lifestyle behaviors and to their current disease condition is critical for understanding possible drivers to participation in WWP. In our study, there were almost no significant associations between being in the pre-action or action stages of change for certain behaviors and likelihood to participate in WWP of related topics. However, the association between stages of change and diagnosed disorders yielded interesting results. Those employees who were in the pre-action or action phase for improving a health

problem they currently have or preventing a previous health problem showed association with having been diagnosed with heart disease, diabetes, and/or depressive disorders. This data is important for understanding where an individual may be regarding their health and offering programs to meet them where they are at.

Furthermore, investigating components that have influenced past participation is essential information to have for the future, especially when used in combination with concepts such as stages of change. Individuals who are already in good health or who are physically active may be more likely to participate in wellness programming (Thompson et al., 2005). Interestingly, some of the greatest predictors of past participation in this study were use of the university's recreational facilities, health status, and frequency of participating in physical activity. Combining the use of factors contributing to participation and whether or not individuals are willing to make behavioral changes is vital for future program creation.

In addition to offering topics that resonate with employees, WWP also need to take other factors into account such as reach, incentives and barriers to participation, and delivery method, among others, in order to offer effective and compelling programs for employees. The majority of respondents of our survey noted being aware of WWP offered through the university. However, only 43.1% of individuals who were aware of WWP had participated in at least one program. Research has indicated that once employees are made aware of programs that may be of interest to them, they are more likely to participate (Tapps et al., 2016). The disconnect between awareness rates and participation rates in WWP could be partially explained by the existing barriers to participation, which have been heavily investigated. Previous findings suggest that the

most common barriers to participation include inadequate incentives, location, time, and lack of interest in topics (Person et al., 2010). When investigating barriers specific to the university setting some of the priorly mentioned criteria may not apply, such as location (Brown et al., 2014). However, the results of the current study determined that over half of the employees noted location to hinder their ability to participate. Other major barriers for the respondents in the present study were: time, scheduling conflict, and location. There are barriers that are more specific to the university setting, such as performing physical activity around colleagues and students (Brown et al., 2014), which is consistent with the results of this study.

Incentives are consistently used in the implementation of WWP as a way to increase participation. Our results exemplify the impact of hypothetical incentives when the rate of respondents not wanting to participate in wellness programs decreased by about 6% in males and 2% in females. Monetary incentives are commonly used (Barleen et al., 2017; Mason et al., 2018), and the present findings reflect that financial incentive was a large draw to WWP for JMU employees (43.5%); however, employees note that their greatest incentive to participate would be to have flexible time off from work in order to participate (57.1%). Importantly, approximately 2 out 5 individuals in the employee sample state that they would participate in employee wellness programs without an incentive.

Delivering programming in an appropriate manner not only aids in participation but can also lead to improvement in outcomes. Group programming has been found to elicit greater benefit in walking and physical activity programs than individual programs (Gu et al., 2020); Ribeiro et al., 2014). While individual programs are still effective, the

group atmosphere was indicated as leading to greater success (Ribeiro et al., 2014). When comparing in-person group programs to in-person individual programs, a greater percentage of JMU employees indicated that they would be more likely to participate in the group program option. Even though on-campus and in-person workshops were highly desired by participants, it must be noted that online and self-directed programs were of interest to nearly half of the survey respondents. Although this survey was administered prior to the Covid-19 pandemic, implementing virtual programs may be a more realistic option in the near future given regulations that have been put in place to keep the population safe and decrease the spread of Covid-19.

Limitations

Limitations of the study include collection methodology, where the survey was sent out on two occasions, allowing individuals to potentially take the survey more than once. Additionally, significantly more female employees responded than did male employees. Although the JMU full time faculty and staff members have a slightly higher percentage of female employees than male, it is not to the extent that is seen in the survey distribution. Additionally, this survey was also administered to part-time employees, of which no university population demographic data was available. Self-selection bias should also be included as a limitation of this study. Finally, limited analysis of the qualitative components of the questionnaire were investigated.

Conclusion

WWP have the potential to positively impact the lives of many employees. Increasing awareness, the use of appropriate incentives, and limiting barriers is essential

to program participation. Incorporating sought after programs is vital to employee interest. Using employee needs to drive the design, development, and implementation of programs will elicit positive benefits for both employees and employers.

Although the current findings may influence the development of future WWP offerings in this University and other institutions, it must be acknowledged that the applicability of some results (i.e., barriers to participation, preferred mode of delivery) may be affected in the short-term due to the current Covid-19 pandemic. Finding ways to safely support faculty and staff members while adhering to Covid-19 guidelines is vital to their wellbeing. To address emerging needs of employees through the pandemic, a follow-up survey is being designed. This survey will allow for a comparison between the needs and desires of employees prior to the Covid-19 pandemic, and after approximately 1-year of Covid-19 implemented safety protocols at the university. In the future, the creation of a standardized employee wellness needs assessment to be used across a multitude of university campuses would be beneficial to the success of the wellness programs offered for university faculty and staff.

Appendix

Appendix A

IRB approval letter

DATE: TO:

FROM:
PROTOCOL TITLE: FUNDING SOURCE: PROTOCOL NUMBER: APPROVAL PERIOD:

NOTICE OF APPROVAL FOR HUMAN RESEARCH

September 27, 2019
Ana Dengo Flores, PhD, Dept. of Health Professions

Taimi Castle, Professor, IRB Panel
Rationale for participation in JMU worksite wellness programs
NONE
20-1203
Approval Date: October 01, 2019 Expiration Date: May 01, 2020

The Institutional Review Board (IRB) for the protection of human subjects has reviewed the protocol entitled, "Rationale for participation in JMU worksite wellness programs," under 45 CFR 46.110 Expedited Category 7. The project has been approved for the procedures and subjects described in the protocol.

If your study requires any changes, the proposed modifications will need to be submitted in the form of an amendment request to the IRB. Any changes require approval before they can be implemented as part of your study. If there are any adverse events and/or any unanticipated problems during your study, you must notify the IRB within 24 hours of the event or problem.

This approval is issued under James Madison University's Federal Wide Assurance 00007339 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under the IRB's Assurance, please do not hesitate to contact ORI.

Please direct any questions about the IRB's actions on this project to the IRB Chair:

Dr. Taimi Castle castletl@jmu.edu (540) 568-5929

Taimi Castle

OFFICE OF RESEARCH INTEGRITY | MSC 5738
HARRISONBURG, VA 22807
540.568.7025 PHONE

Appendix B

Faculty and staff wellness program interest survey

Informed Consent (Qualtrics)

Identification of Investigators & Purpose of Study

You are being asked to participate in a research study conducted by Rebecca Mathien (Health Professions), Dr. Laura Dengo (Health Professions), and Dr. Beth Cochran (Mathematics and Statistics), in conjunction with the Balanced Dukes program at James Madison University (JMU). The purpose of this study is to determine the wellness needs of JMU faculty and staff in order to create future wellness programs that are more tailored to the needs of employees.

Research Procedures

This study consists of an online survey that will be administered via Qualtrics. You will be asked to provide answers to a series of questions related to awareness of wellness program offerings at JMU, wellness topics of interest, time preferences for programs, methods for content delivery, and barriers to participation.

Time Required

Participation in this study will require about fifteen minutes of your time.

Risks

The investigator does not perceive more than minimal risks from your involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits

There are no direct benefits of participating in this survey, but the research findings will inform the development of future employee wellness programs and health interventions focused on adoption of long-term healthy lifestyles.

Confidentiality

The results of this research will be presented at conferences or published in scientific journals. While individual anonymous responses are obtained and kept in the strictest confidence, aggregate data will be presented representing averages or generalizations about the responses as a whole. No identifiable information will be collected from the participant and no identifiable responses will be presented in the final form of this study. All data will be stored in a secure location accessible only to the researchers. The researcher retains the right to use and publish non-identifiable data.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind. However,

once your responses have been submitted and anonymously recorded you will not be able to withdraw from the study.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Rebecca Mathien
Department: Health Professions
James Madison University
Email Address: mathierx@dukes.jmu.edu

Laura Dengo, PhD
Department: Health Professions
James Madison University
Email Address: dengofal@jmu.edu

Questions about Your Rights as a Research Subject

Dr. Taimi Castle
Chair, Institutional Review Board
James Madison University
(540) 568-5929
castletl@jmu.edu

Giving of Consent

I have read this consent form and I understand what is being requested of me as a participant in this study. I certify that I am at least 18 years of age. By clicking on the option below, and completing and submitting this survey, I am consenting to participate on this research.

This study has been approved by the IRB, protocol #20-1203.

Faculty and Staff Wellness Program Interest Survey

What is a wellness program?

University wellness programs are designed to improve the health of employees. Wellness programs provide opportunities to improve on physical, emotional, financial, social, and other aspects of health. Programs may be presented through workshops, online challenges, in person meetings, and more.

3. Age (drop down box)
4. Gender
   - ☐ Male
   - ☐ Female
   - ☐ Undisclosed
5. Height (drop down box)
6. Weight (drop down box)
7. Please indicate if you are a full time or part time JMU employee.
   - ☐ Full time
   - ☐ Part time
8. Please indicate if you are a JMU faculty or staff member.
   - ☐ Faculty member
   - ☐ Staff member
9. Are you aware of any wellness programs currently offered at JMU? If no, skip to question 15.
   - ☐ Yes
   - ☐ No
10. Are the communications regarding wellness programs and opportunities clear and effective?
    - ☐ Yes
    - ☐ No
    - ☐ I do not receive communications about wellness programs or opportunities.
11. Have you participated in wellness programs offered at JMU? If no, skip to question 13.
    - ☐ Yes
    - ☐ No
12. How beneficial was the wellness program you attended?

	Not at all Beneficial	**Slightly Beneficial**	**Moderately Beneficial**	**Very Beneficial**	**Extremely Beneficial**	**N/A**

Physical Activity Program	☐	☐	☐	☐	☐	☐
Nutrition Program	☐	☐	☐	☐	☐	☐
Mental Health/Stress Management Program	☐	☐	☐	☐	☐	☐
Financial Management Program	☐	☐	☐	☐	☐	☐
Goal Setting Program	☐	☐	☐	☐	☐	☐
Other:	☐	☐	☐	☐	☐	☐

13. Have you found that wellness programs and events are scheduled at times that are conducive to your schedule, making it possible to participate?
    - ☐ Yes
    - ☐ No
    - ☐ Sometimes
    - ☐ Not sure
14. Overall, how pleased are you with the wellness programs offered at JMU?
    - ☐ Not Pleased
    - ☐ Slightly Pleased
    - ☐ Neutral
    - ☐ Very Pleased
    - ☐ Extremely Pleased
    - ☐ I'm not interested in wellness programs
15. Which of the following general wellness topics are of the most interest to you? Select all that apply.
    - ☐ Physical activity
    - ☐ Nutrition
    - ☐ Lifestyle wellness
    - ☐ Mental health
    - ☐ Chronic disease management
    - ☐ Finances and organizational skills
    - ☐ Other:

16. How likely are you to participate in the following wellness programs/topic workshops if offered at JMU?

Topic	Not likely at all	Somewhat unlikely	Undecided	Somewhat likely	Very likely
Stress management	☐	☐	☐	☐	☐
Emotional health	☐	☐	☐	☐	☐
Mental health	☐	☐	☐	☐	☐
Financial management	☐	☐	☐	☐	☐
Work/life balance	☐	☐	☐	☐	☐
Healthy cooking/eating	☐	☐	☐	☐	☐
Weight management	☐	☐	☐	☐	☐
Group exercise classes at UREC with entire JMU community	☐	☐	☐	☐	☐
Group exercise classes at	☐	☐	☐	☐	☐

UREC with F/S only					
Walking/running programs	☐	☐	☐	☐	☐
On-campus fitness/ physical activity outside of UREC	☐	☐	☐	☐	☐
Heart health	☐	☐	☐	☐	☐
Cholesterol management	☐	☐	☐	☐	☐
Diabetes management	☐	☐	☐	☐	☐
Blood pressure management	☐	☐	☐	☐	☐
Sleep	☐	☐	☐	☐	☐
Smoking cessation	☐	☐	☐	☐	☐
Men's/women's health	☐	☐	☐	☐	☐
Disability Management	☐	☐	☐	☐	☐

17. Please select which screenings you would be interested in if they were offered at JMU. Select all that apply.

- ☐ Blood pressure
- ☐ Blood glucose/diabetes
- ☐ Cholesterol
- ☐ Body composition (body weight and body fat analysis)
- ☐ Fitness testing
- ☐ Flu shot
- ☐ Bone density
- ☐ None

18. Please indicate what time of day you would be most willing to participate in a wellness activity? Select all that apply.
    - ☐ Before 8am
    - ☐ 8am-12pm
    - ☐ 12pm-5pm
    - ☐ After 5pm
    - ☐ On weekends
19. What is the ideal length of time that a wellness activity should last?
    - ☐ <30 minutes
    - ☐ 30-45 minutes
    - ☐ 45-60 minutes
    - ☐ 60-90 minutes
    - ☐ 90-120 minutes
    - ☐ >120 minutes

20. If the wellness topic is of interest to you, how frequently would you attend a related program or workshop?
    - ☐ Every day
    - ☐ Several times a week
    - ☐ Once a week
    - ☐ Twice a month
    - ☐ Once a month
    - ☐ Every 2-3 months
    - ☐ I would not attend even if the topic interested me

21. Please indicate which of the following best represents you concerning each topic. Source: CDC Employee Health Assessment (CAPTURE™).

	I am satisfied with the way I am now and have no desire to change	I have considered making healthier choices	I have seriously considered making healthier choices and I am ready to make a change	I have started making healthier choices	I have already made changes for a healthier lifestyle and I am trying to maintain them	Not sure/Don't know

Eating healthy	☐	☐	☐	☐	☐	☐
Weight loss	☐	☐	☐	☐	☐	☐
Physical activity	☐	☐	☐	☐	☐	☐
Tobacco use	☐	☐	☐	☐	☐	☐
Work/life balance	☐	☐	☐	☐	☐	☐
Improve a health problem I have now/prevent future health problems	☐	☐	☐	☐	☐	☐
Alcohol use	☐	☐	☐	☐	☐	☐

22. Please select the optimal platform that you would like to receive information regarding JMU's wellness programs and workshops. Select all that apply.
    - ☐ Written material/flyers
    - ☐ E-mail
    - ☐ Department/office meetings
    - ☐ Online
    - ☐ Other:_____.
23. Which program delivery method would you be most likely to participate in? Select all that apply.
    - ☐ Health fairs
    - ☐ On-campus workshops
    - ☐ Individual online programs
    - ☐ Group online programs
    - ☐ In-person group programs
    - ☐ In-person individual programs
    - ☐ Videos
    - ☐ Self-directed programs
    - ☐ Other_____.
24. Please indicate all barriers that would hinder your participation in worksite wellness programs.
    - ☐ Time
    - ☐ Scheduling conflict with program offerings
    - ☐ Prefer to keep work and personal life separate

- ☐ Confidentiality of personal information
- ☐ Location of workshops
- ☐ Motivation
- ☐ Do not want to interact with colleagues
- ☐ Childcare needs
- ☐ Inability for spouse or significant other to participate
- ☐ Unaware of programs available
- ☐ Not Interested
- ☐ Lack of supervisor support
- ☐ Physical Disability
- ☐ Other

25. Do you use the UREC facilities? If never, skip to question 27.
    - ☐ Never
    - ☐ Rarely
    - ☐ In the past but not anymore
    - ☐ Occasionally
    - ☐ Frequently
26. If you have ever used UREC, which services have you used? Select all that apply.
    - ☐ Group exercise open to the general public
    - ☐ Group exercise open only to faculty/staff
    - ☐ Weight floor
    - ☐ Cardio equipment/ track
    - ☐ Lap pool
    - ☐ Recreational pool
    - ☐ Recreational courts at UREC or UPark
    - ☐ Wellness center
    - ☐ Rental equipment
    - ☐ Affinity groups
    - ☐ Other
27. What has prevented you from utilizing the UREC facilities? Select all that apply.
    - ☐ Not interested
    - ☐ Crowded
    - ☐ Parking
    - ☐ Student interaction
    - ☐ Inconvenient
    - ☐ Unfamiliar with how to use equipment
    - ☐ Other
28. Do you pay for a fitness membership outside of UREC? This includes but is not limited to yoga membership, online training programs and apps, gym memberships, etc.
    - ☐ Yes
    - ☐ No
29. What incentives would motivate/encourage you to participate in a worksite wellness program? Select all that apply.
    - ☐ I would participate if an incentive was not offered
    - ☐ Financial rewards

- ☐ General health information
- ☐ Personal health information
- ☐ Flexible time off from work to participate
- ☐ I would not participate even if an incentive was offered
- ☐ Other:

Optional Questions

Thank you so much for completing the survey to this point. The following questions are optional but should only take 2-3 minutes to complete. We really appreciate your responses.

31. In general, how would you rate your health?

Poor	Fair	Average	Good	Excellent
☐	☐	☐	☐	☐

32. How would you rate your health today, when compared to one year ago?

Much Worse	Worse	About the Same	Better	Much Better
☐	☐	☐	☐	☐

33. How much did you weigh one year ago? Drop down
34. Is your weight fairly stable or does it fluctuate?
    - ☐ Stable
    - ☐ Fluctuates
    - ☐ Unsure
35. Have you ever been diagnosed with any of the following disorders? Select all that apply.
    - ☐ Heart disease
    - ☐ Atrial fibrillation
    - ☐ Congestive heart failure
    - ☐ High blood pressure
    - ☐ Borderline hypertension or pre-hypertension
    - ☐ High cholesterol
    - ☐ Diabetes
    - ☐ Borderline diabetic or pre-diabetes
    - ☐ COPD or emphysema
    - ☐ Asthma
    - ☐ Arthritis
    - ☐ Chronic lower back pain
    - ☐ Physical Disability
    - ☐ A depressive disorder
36. Please select the following conditions that you are currently taking medications for. Select all that apply.
    - ☐ High blood pressure

- ☐ High cholesterol
- ☐ Diabetes
- ☐ Arthritis
- ☐ Low back pain
- ☐ None

37. On average, how many hours per day do you usually spend at work?
    1 2 3 4 5 6 7 8 9 10
38. On average, how many hours per day do you usually spend sitting at work?
    1 2 3 4 5 6 7 8 9 10
39. How many total hours per day do you usually spend sitting, including at work and on your own time? (drop down)
40. Approximately how many hours per night do you usually sleep?
    1 2 3 4 5 6 7 8 9 10 10+
41. During the last month, have you participated in any form of physical activity outside of the workplace (running, walking for exercise, biking, golf, tennis, swimming for exercise, etc.)? If no, end of survey.
    - ☐ Yes
    - ☐ No
    - ☐ Not sure
42. Approximately how many times during the last month did you take part in these activities: drop down
43. On average, how long did each of these activities take:
    - ☐ <15 min
    - ☐ 15-30 min
    - ☐ 31-45 min
    - ☐ 46-60 min
    - ☐ 61-90 min
    - ☐ >90 min

References

Aguilar, M., Bhuket, T., Torres, S., Liu, B., & Wong, R. J. (2015). Prevalence of the Metabolic Syndrome in the United States, 2003-2012. *JAMA*, *313*(19), 1973–1974. https://doi.org/10.1001/jama.2015.4260

Ashley Lynne Person, Sarah Elizabeth Colby, Jessica Ann Bulova, & Janie Whitehurst Eubanks. (2010). Barriers to participation in a worksite wellness program. *Nutrition Research and Practice*, *4*(2), 149–154. https://doi.org/10.4162/nrp.2010.4.2.149

Barleen, N. A., Marzec, M. L., Boerger, N. L., Moloney, D. P., Zimmerman, E. M., & Dobro, J. (2017). Outcome-based and Participation-based Wellness Incentives. *Journal of Occupational and Environmental Medicine*, *59*(3), 304–312. https://doi.org/10.1097/JOM.0000000000000965

Beck, A. J., Hirth, R. A., Jenkins, K. R., Sleeman, K. K., & Zhang, W. (2016). Factors Associated With Participation in a University Worksite Wellness Program. *American Journal of Preventive Medicine*, *51*(1), e1–e11. https://doi.org/10.1016/j.amepre.2016.01.028

Brown, T. C., Volberding, J. L., Baghurst, T., & Sellers, J. (2014). Faculty/staff perceptions of a free campus fitness facility. *International Journal of Workplace Health Management*, *7*(3), 156–170. https://doi.org/10.1108/IJWHM-05-2013-0020

Byrne, D., Goetzel, R., McGown, P., Holmes, M., Beckowski, M., Tabrizi, M., Kowlessar, N., & Yarbrough, M. (2011). Seven-Year Trends in Employee Health Habits From a Comprehensive Workplace Health Promotion Program at Vanderbilt University. *Journal of Occupational and Environmental Medicine*, *53*(12), 1372–1381. https://doi.org/10.1097/JOM.0b013e318237a19c

CDC National Healthy Worksite Program (NHWP). *Employee Health Assessment (CAPTURE)*. *Generic*.

Gu, M., Wang, Y., Shi, Y., Yu, J., Xu, J., Jia, Y., & Cheng, M. (2020). Impact of a group-based intervention program on physical activity and health-related outcomes in worksite settings. *BMC Public Health*, *20*(1), 935. https://doi.org/10.1186/s12889-020-09036-2

Hales CM, Carroll MD, Fryar CD, Ogden CL. Prevalence of obesity and severe obesity among adults: United States, 2017–2018. NCHS Data Brief, no 360. Hyattsville, MD: National Center for Health Statistics. 2020.

Hill-Mey, P. E., Kumpfer, K. L., Merrill, R. M., Reel, J., Hyatt-Neville, B., & Richardson, G. E. (2015). Worksite health promotion programs in college

settings. *Journal of Education and Health Promotion*, *4*(1), 12. https://doi.org/10.4103/2277-9531.154019

Huang, S.-L., Li, R.-H., Huang, F.-Y., & Tang, F.-C. (2015). The Potential for Mindfulness-Based Intervention in Workplace Mental Health Promotion: Results of a Randomized Controlled Trial. *PloS One*, *10*(9), e0138089. https://doi.org/10.1371/journal.pone.0138089

Lallukka, T., Pietilainen, O., Jappinen, S., Laaksonen, M., Lanti, J., Rahkonen, O. (2020). Factors associated with health survey response among young employees: a register-based study using online, mailed, and telephone interview data collection methods. *BMC Public Health.* 20:181. doi: 10.1186/s12889-020-8241-8.

Leininger, L. J., Adams, K. J., & Debeliso, M. (2015). Differences in health promotion program participation, barriers and physical activity among faculty, staff and administration at a university worksite. *International Journal of Workplace Health Management.* 8(4): 246-255. doi:10.1108/IJWHM-10-2014-0045

Lowensteyn, I., Berberian, V., Berger, C., Da Costa, D., Joseph, L., & Grover, S. A. (2019). The sustainability of a workplace wellness program that incorporates gamification principles: Participant engagement and health benefits after 2 years. *American Journal of Health Promotion,* , 89011711882316. doi:10.1177/0890117118823165

Mason, M. R., Ickes, M. J., Campbell, M. S., & Bollinger, L. M. (2018). An Incentivized, Workplace Physical Activity Intervention Preferentially Increases Daily Steps in Inactive Employees. *American Journal of Health Promotion*, *32*(3), 638–645. https://doi.org/10.1177/0890117117723803

Mattke, S., Kapinos, K., Caloyeras, J. P., Taylor, E. A., Batorsky, B., Liu, H., Van Busum, K. R., & Newberry, S. (2015). Workplace Wellness Programs: Services Offered, Participation, and Incentives. *Rand Health Quarterly*, *5*(2), 7.

Maurer, D. M., Raymond, T. J., & Davis, B. N. (2018). Depression: Screening and Diagnosis. *American Family Physician*, *98*(8), 508–515.

Merrill, R., Aldana, S., Garrett, J., & Ross, C. (2011). Effectiveness of a Workplace Wellness Program for Maintaining Health and Promoting Healthy Behaviors. *Journal of Occupational and Environmental Medicine*, *53*(7), 782–787. https://doi.org/10.1097/JOM.0b013e318220c2f4

Michaels, C. N., & Greene, A. M. (2013). Worksite wellness: Increasing adoption of workplace health promotion programs. *Health Promotion Practice*, *14*(4), 473–479. https://doi.org/10.1177/1524839913480800

Miller, C. (2019). Adaptive Intervention Designs to Promote Behavioral Change in Adults: What Is the Evidence? *Current Diabetes Reports*, *19*(2), 1–9. https://doi.org/10.1007/s11892-019-1127-4

Mynor G Rodriguez-Hernandez & Danielle W Wadsworth. (2019). The effect of 2 walking programs on aerobic fitness, body composition, and physical activity in sedentary office employees. *PLoS One*, *14*(1), e0210447. https://doi.org/10.1371/journal.pone.0210447

Ribeiro, M., Martins, M., & Carvaino, C. R. (2014). Interventions to Increase Physical Activity in Middle-Age Women at the Workplace: A Randomized Controlled Trial. *Medicine & Science in Sports & Exercise*, *46*(5), 1008–1015. https://doi.org/10.1249/MSS.0000000000000190

Tapps, T., Symonds, M., & Baghurst, T. (2016). Assessing employee wellness needs at colleges and universities: A case study. *Cogent Social Sciences*, *2*(1), 1250338. https://doi.org/10.1080/23311886.2016.1250338

Thompson, S. E., Smith, B. A., & Bybee, R. F. (2005). Factors influencing participation in worksite wellness programs among minority and underserved populations. *Family & Community Health*, *28*(3), 267–273. https://doi.org/10.1097/00003727-200507000-00007

Weber, S., Lorenz, C., & Hemmings, N. (2019). Improving Stress and Positive Mental Health at Work via an App-Based Intervention: A Large-Scale Multi-Center Randomized Control Trial. *Frontiers in Psychology*, *10*:2745. https://doi.org/10.3389/fpsyg.2019.02745