

OLDER EMPLOYEES' PARTICIPATION IN A WORKPLACE WELLNESS PROGRAM
AND BEHAVIOR CHANGE: THE ILLINOIS WORKPLACE WELLNESS STUDY

BY

DO YUN KIM

THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Science in Recreation, Sport, and Tourism
in the Graduate College of the
University of Illinois Urbana-Champaign, 2021

Urbana, Illinois

Advisers:

Professor Laura L. Payne
Associate Professor Toni Liechty

ABSTRACT

As of the turn of the 21st century, life expectancy in the United States increased by nearly a decade, and injuries and illnesses among private industry workplaces have decreased significantly (Woolf & Schoemaker, 2019; U.S. Bureau of Labor Statistics, 2019). However, the health and well-being of older employees are threatened due to an increase in the elderly working population and an increase in unhealthy lifestyles (Centers for Disease Control and Prevention, 2017). Accordingly, various workplace wellness programs have been introduced employers (Pencak, 1991; Reardon, 1998). The workplace wellness program has a great effect on improving employees' health and reducing medical expenses (Merrill et al., 2011; Neville et al., 2011; Schwatka et al., 2018; Steffen et al., 2015). However, the actual participation rate of employees is relatively low due to barriers coming from culture, environment, worksite characteristics, employee interest, and involvement (Claxton et al., 2015; Miller, 2009; Person et al., 2010; Warehime et al., 2019). Also, elderly workers need a wellness program tailored for them according to their physical and external environments (Cornwell & Waite, 2009; Jaul & Barron, 2017; National Research Council, 2004; Truxillo et al., 2015). This study examined the factors that motivate participation among older employees in a workplace wellness program. Specifically, the study examined the factors of age, health behavior, wellness program participation rate, level of job satisfaction, absenteeism and presenteeism, presence or absence of chronic disease that affected older participants' experience in the workplace wellness program.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: LITERATURE REVIEW	7
CHAPTER 3: METHODS	21
CHAPTER 4: RESULTS.....	29
CHAPTER 5: DISCUSSION.....	51
REFERENCES	65
APPENDIX A: IRB APPROVAL LETTER	82

CHAPTER 1: INTRODUCTION

As we entered the twenty-first century, life expectancy of the United States has increased almost 10 years from 69.9 years in 1959 to 78.9 years in 2016 (Woolf & Schoomaker, 2019). Also, nonfatal injuries and illnesses among private industry workplaces have decreased dramatically from 10.9 cases per 100 full-time equivalent workers in 1972 to 2.8 cases in 2018 (U.S. Bureau of Labor Statistics, 2019). However, due to an aging society, health disparities and increased health risks due to lifestyle behaviors (e.g., inactivity, poor nutrition, tobacco, and alcohol consumption) contributed to a significant increase in chronic diseases, which can decrease quality of life, lead to premature death and disability, and increased health care spending (Centers for Disease Control and Prevention, 2017).

These health problems have also caused damage in workplace by reducing work productivity, increasing absenteeism, presenteeism, and early retirement (Caverley et al., 2007; Oksanen & Virtanen, 2012). To improve employees' health and wellbeing and reduce the cost of health care, many employers have adopted workplace wellness programs, which promote employees' health status and prevent diseases and injuries (Mattke et al., 2013a; Mattke et al., 2013b). Workplace wellness programs have become very common in workplace settings in that 81 percent of employers with 200 or more employees and 41 percent of small employers reported that they offer a workplace wellness program to employees according to a 2015 survey (Claxton et al., 2015). However, even with the high prevalence of workplace wellness programs, participation in these programs is typically less than 20 percent of employees, and wellness program participation does not always lead to improved employee's health (Claxton et al., 2015). One study showed that these failures might come from insufficient incentives, inconvenient

locations, time constraints, lack of interest in topics presented, undefined reasons, schedules, marketing, health beliefs, and lack of interest in the program (Person et al., 2010).

Besides these reported challenges to workplace wellness programs, due to an aging society, workplaces should prepare more tailored workplace wellness programs to meet the needs of older employees. In fact, older adults and older employees are on the rise. For example, the United Nations (UN, 2019) reported there were more than 700 million people who are over the age of 65 in 2019. Researchers from the UN expected the number of older adults will double to 1.5 billion in 2050. In the United States, the population of people who are aged 65 and over numbered 49.2 million in 2016, which represented 15.2% of the population (US Department of Health and Human Services, 2019). The Bureau of Labor Statistics (2020) shows that employment of workers aged 65 or older has grown by 55% from 2011 to 2019. These statistics indicate that organizations will inevitably need to cater their wellness programs to older employees. For these reasons, workplace wellness programs should be designed to address the needs of a larger older population.

In addition to the fact that the older adult proportion of the workforce is growing, there is evidence that working later in life benefits older adults' health. According to Aday & Kehoe (2008), older workers showed greater confidence, empowerment, and self-esteem as well as a heightened sense of control in their own daily lives. Another study showed that older workers experienced a 25 percent increase in the size of their social networks, while people who retired had smaller social networks (Patacchini & Engelhardt, 2016). The increased social connections and intellectual stimulation could also help people to maintain their cognitive functioning (Today's Research on Aging, 2018). Moreover, older adults in retirement may encounter financial problems due to significantly reduced income. Munnell et al. (2016) argued that

working later in life helps to delay income reduction and enables older employees to save more money for their retirement fund. There are also benefits that older adults could obtain from being employed such as health insurance, opportunities to try new things, and increased opportunity for physical activity. Research has shown that retirement can trigger difficulties with mobility and daily activities, increases in chronic disease, and declines in mental and psychological well-being (Dave et al., 2006; Kim & Moen 2002; Mandal & Roe 2007). In fact, Buber et al. (2006) found that the negative effects of retirement start to appear after the first few years of unemployment rather than immediately upon retirement.

From a business aspect, hiring older employees can have many benefits. According to Feinsod & Davenport (2006), employees' motivation and engagement in their work increases with age. Also, they found that delaying retirement saves costs on new hiring and turnover. Hewitt (2015) showed that hiring older employees could help employers to hire skilled and talented workers for their business, add value such as high levels of engagement, productivity, experience, and generational diversity. According to a Forbes article (2019), hiring older employees benefits the business since older employees show good decision-making skills, cognitive capacity, leadership skills, collaborative attitudes, and are well qualified to serve as mentors.

Despite the benefits of staying employed full-time in later life, working later in life can be difficult due to limitations and disabilities associated with age such as physical and mental health issues, difficulties keeping up with changes in technology and industry knowledge, difficulties with workplace accessibility, discrimination and negative stereotypes on older workers (Wegman & McGee, 2004). White et al. (2018) reported that more than two-thirds of older workers who take benefits from the Medicare system have at least two or more chronic

health conditions, which can cause more serious injuries compared to workers who are free of chronic disease. Also, beginning in 2020, the COVID-19 pandemic has caused difficulties in hiring older adults and the unemployment rate rose to 14.3 percent compared to 2019 when the unemployment rate was 3 percent (Bui et al., 2020; Bureau of Labor Statistics 2020). The pandemic presents ongoing issues for workplaces and especially older workers because they have a comparably higher risk for serious disease and death from COVID-19 than other age groups (CDC COVID-19 Response Team, 2020). In these circumstances, workplace wellness programs can be a strategy to cope with the limitations such as health risk and workplace accessibility challenges and to offer opportunities for older workers to continue or start an encore career.

Conceptual Frameworks

This study will use the Health Belief Model (Hochbaum et al., 1952; Rosenstock, 1974) and Activity Theory (Havighurst, 1963). The Health belief model (HBM) is widely used to examine the motivation of individuals who participate or do not participate in health promotion and disease prevention programs including workplace wellness programs (Gristwood, 2011; Hartman, 2002; Melzner et al., 2014; Saghafi-Asl et al., 2020). HBM will help us examine the reason why older employees participate or do not participate in workplace wellness programs and offer insights into how to motivate older employees to participate in workplace wellness programs being studied. HBM is a social psychological health behavior change model that explains and predicts health-related behaviors. HBM states that people take action to prevent, screen, or control illness conditions because of factors such as susceptibility, seriousness, benefits, and barriers to a behavior, cues to action, and self-efficacy. (Champion & Skinner, 2008).

Activity Theory argues that older adults should be integrated into society and continue social activities for as long as possible in order to increase their psychological satisfaction and life satisfaction and pursue successful aging. Thus, proponents of Activity theory assert that older adults should avoid a sedentary lifestyle and they consider it essential to health and happiness that older adults remain physically and socially active (Brown, 2015; Havighurst, 1963). Due to these aspects, many researchers used Activity Theory to analyze the motivations of the older adults who pursue social and physical activity in later life (Gillespie & Louw, 1993; Janssen, 2011; Miltiades et al., 2005; Steinkamp & Kelly, 1987).

Significance of the Study

Numerous studies document the benefits of workplace wellness through various aspects including occupational health, financial benefits, and social integration (Baicker et al., 2010; Merrill et al., 2011; Pronk, 2014). The domain of workplace wellness is growing fast in the current literature and affects the workplace environment by offering workplace health promotion programs such as health screening and disease management programs (Claxton et al., 2015). However, there are comparably fewer studies and investments focused on older employees' workplace wellness. There is plenty of literature related to successful retirement, but scant research focuses on older workers and their workplace settings. Also, the lack of research in this area may contribute to problems such as health and safety problems, early retirements, and social disparities among older employees (Wegman & McGee, 2004).

This paper focuses on the characteristics of older employees and examines their participation in a workplace wellness program. Also, by analyzing the Illinois workplace wellness study (Reif et al., 2020), I will examine the actual benefits of workplace wellness on older employees and suggest ways workplace wellness programs can be modified to maximize

the advantage of the workplace settings for older employees. This insight will allow the professionals to reduce the gap between literature and the actual environment and provide better opportunities and environments to older employees.

Research Questions

For the purpose of this study, the following research questions were addressed:

1. What is the relationship between age and the frequency of engaging in health behaviors?
2. Is there a relationship between age and workplace wellness program participation?
3. Among the older aged groups, did the participants of the workplace wellness program have higher levels of job satisfaction, lower rates of absenteeism, and presenteeism compared to the control group (older adults who did not participate in the workplace wellness program)?
4. Among the older aged groups, is the presence or absence of chronic disease related to workplace wellness program participation?

CHAPTER 2: LITERATURE REVIEW

Workplace Wellness Program Overview

Since there is no standardized definition of a workplace wellness program, a functional definition of workplace wellness program is found in Healthy People (2010). They define worksite health promotion programs as providing health education, supportive social and physical environments, integration into the organization's structure, links to related programs like Employee Assistance Programs (EAP), and worksite screenings (Linnan et al., 2008).

Workplace wellness programs developed from the 1970s with the rise of the occupational safety and health movement and the worksite health promotion movement. These developments changed our conceptualization of health from viewing good health as the absence of disease and injury to defining health as a comprehensive healthy lifestyle that emphasizes wellness and prevention (Pencak, 1991). In addition, workplace wellness grew due to the increase in the incidence of diseases and treatment difficulties, the increase in medical costs, and the need for preventing sickness has increased significantly. The growth of the wellness industry led researchers to develop health promotion models and programs, and led companies and employers to provide health promotion programs to their employees (Reardon, 1998).

The positive effects of workplace wellness programs have been documented through various research studies. Merrill et al. (2011) found that participants of a workplace wellness program showed significant improvements in health behaviors such as frequency of exercise, consumption of whole grains, vegetables and fruits, and restful sleep. Improvements in stress, overall health, depression, smoking status, alcohol use, vegetable and fruit consumption, physical activity, and their perceptions of job health culture were also found in another study (Schwatka et al., 2018). Steffen et al. (2015) found that participants from the worksite healthy sleep program

felt significantly more rested, more confident in their ability to deal with sleep problems, and more knowledgeable about sleep. Neville et al. (2011) conducted an eight-year longitudinal study collecting annual data, including clinical measures of weight, blood pressure, cholesterol, and body fat percentage of the participants of the workplace wellness program. The results indicated that participants showed improvements in body mass index (BMI), blood pressure, and cholesterol, especially in the high-risk groups. In addition, with the health benefits that accrued from the workplace wellness program, researchers argued that medical costs fell by about \$3.27 for every dollar spent on wellness programs and that absenteeism costs fell by about \$2.73 for every dollar spent (Baicker et al., 2010).

Despite these benefits of workplace wellness programs, actual participation in these wellness programs is typically less than 20 percent of employees and participating in wellness programs does not always lead to improved employee health (Claxton et al., 2015). The lack of results may come from barriers such as culture, environment, worksite characteristics, employee interest and involvement, established wellness culture, awareness, accessibility, and support from supervisors (Warehime et al., 2019). Another study showed that these low participation rates might be explained by insufficient incentives, inconvenient locations, time limitations, lack of interest in topics presented, undefined reasons, schedule conflicts, marketing, health beliefs, and not being interested in the program (Person et al., 2010). Even more, there are additional difficulties for older employees in the workplace environment. Miller (2009) discusses that older adults have additional barriers including impaired health, fear of injury, negative attitudes toward exercise, lack of access to convenient locations, and limited knowledge of the benefits of exercise. The next section provides an analysis of the problematic environment and personal

limitations in the workplace for older workers and examines approaches to enhance the workplace environment for them.

Problematic Environment and Personal Limitations in the Workplace for Older Workers

Just like all other employees, older employees need a well-designed workplace environment. Often, however, workplaces lack a well-designed environment for employees. Maestas et al., (2017) conducted survey research on 2,032 paid workers related to their working conditions. The results showed that 61% of the participants perform repetitive or intense physical work and 20% reported recent abuse or harassment at work. More than half of the participants stated they had to work extra time to fulfill the demands of the work and 36% of the participants indicated their work hours were set by their employers with no flexibility. Besides poor work environments, older employees may also have disabilities related to age, chronic conditions, physical and mental instability, and poor social relationships from losing family and friends. It is important to improve working conditions because dangerous workplace environments can harm older workers' health, cause workplace accidents and injuries, and reduce work efficiency. In this section, I will especially focus on the problematic workplace environment and personal limitations that older employees face inside and outside of the workplace.

Physical Health

Due to the age of older employees, they are at greater risk of having various physical disorders and chronic diseases. Also, age-related physical changes often involve declines in functional status brought on by age-related changes in the sensory system (visual and auditory system), muscular strength and range of joint movement, posture and balance system, cardiovascular and respiratory systems, and the immune system (Jaul & Barron, 2017). These age-graded changes may cause health issues which can affect employees' quality of life, work

efficiency, and they can increase the risk of workplace injuries, which can contribute to the onset of disability or chronic disease after retirement. (Truxillo et al., 2015).

Health concerns among older workers have been documented in different settings. For example, Hong et al. (2015) found that musculoskeletal pain, stress, occupation type, smoking, diabetes, unstable employment status, and working hours negatively affected Korean older workers' quality of life. Another research study showed that older employees were more vulnerable to health risks than younger employees since older employees are more likely to perceive seriously on each of the various adverse health outcomes such as physical, ergonomic, and psychosocial risk factors (Jones et al., 2013). However, older employees reported fewer accidents and injury rates than younger employees. However, when workplace accidents occurred, they were more likely to be serious or fatal accidents (Farrow & Reynolds, 2012). Workers who are more than 65 years old showed the highest fatal injury rate (9.4 per 100,000 workers) compared to other age categories. The same type and degree of injuries tend to cause injuries that are more serious to older workers compared to other age groups (Statistics, B. O. L. 2016). Hoonakker & Duivenbooden (2010) monitored the working condition of older workers in the Dutch construction industry and found that older construction workers tend to have more complaints about working in awkward postures and health-related factors than workers in other age categories. These results may have emerged because working in awkward postures can be considered as a risk factor for musculoskeletal disorders of which older adults are vulnerable. Kenny et al. (2008) claimed that demand for hiring older workers has globally increased but the workload for older workers has not decreased much. From the ages of 40 to 60 years, an average decline of 20% in physical work capacity has been reported. This discord between physical ability and job demand can cause a higher risk of injuries and illness in the workplace. Also,

especially during today's COVID-19 pandemic situation, older adults are more vulnerable to the disease due to their age and physical condition. If older workers cannot receive proper protective gear and sick leave in the workplace, they will be the most vulnerable workers during the pandemic era (Ghilarducci & Farmand, 2020). Due to these problematic workplace environments and the increased prevalence of chronic disease and risk of disability among older adults, organizations and employers should provide health promotion programs and safe work environments to older employees.

Mental and Cognitive Health

Among older workers, there are increasing recognitions of work-related mental health, psychosocial, and organizational issues such as stress, depression, loneliness, sleep problems, burnout, chronic fatigue syndrome, and alcohol and substance abuse. Also, due to the effects of aging, older workers may be at risk for mild cognitive impairment such as long-term and short-term memory loss, decline in reasoning, spatial abilities, processing speed, and concentration (National Research Council, 2004).

Leijten et al. (2015) conducted a 1-year follow-up study among older workers and found that unfavorable physical factors such as high physical workload and demand and lower autonomy level were associated with poorer mental health, which can lower work engagement. Another study showed that poor mental health status was the most important determinant of work behavior among older adults (Mitchell & Anderson, 1989). Physical health problems predicted an increased disability risk, but psychological health problems predicted unemployment and early retirement (Leijten et al., 2015). Fleming et al. (2007) found out that older workers reported more harmful health behaviors such as current smoking and risky drinking compared to non-working older adults. Also, older US workers who reported overall

healthy behaviors were less than 4% of the population. Older workers who perceived effort-reward imbalance (ERI), which occurs with high effort and low reward in their workplace tended to experience sleep problems and the longer the worker perceived ERI, the more they had difficulties in sleeping (Cho & Chen, 2020). Henkens & Leenders (2010) found that a large workload, heavy physical work, lack of challenge, autonomy, and social support from other workers and managers can cause burnout symptoms, which can also lead to a determination to retire (Ahola et al., 2008). Compared to the male workers, who showed a reduction of burnout level while getting older, the female workers showed high burnout levels in two age groups; aged between 20–35 and over 55 years (Marchand et al., 2018). Also, there were differences among older and younger workers in describing the physical, emotional, and behavioral symptoms of burnout in the workplace. Older employees were more susceptible to physical and emotional symptoms while younger employees had difficulty with emotional symptoms (Rožman et al., 2017). Sensitivity to heavy workloads and counseling programs are programs that can improve older workers' mental, psychological, and cognitive health. Employers should also attend to the social health of their workforce in addition to burnout and workload demand issues.

Social Health

Older adults can be susceptible to loneliness and social isolation because they are more likely to face factors such as living alone, losing family or friends, having a small social network, and having less opportunity to participate in social activities (Cornwell & Waite, 2009). Older adults can indeed build more social relationships and opportunities to participate in social activities when they are employed. However, in the workplace, older adults also face challenges with ageism, stereotypes, discrimination, and lack of social interaction and engagement in the workplace (Truxillo et al., 2015).

For example, Weber et al. (2019) conducted a systematic review of 25 studies related to the individual consequences of age stereotypes on older workers. They found that most studies showed a significant relationship between negative age stereotypes and decreased self-efficacy, job satisfaction, performance, and increased intention on retirement and resignation of older employees. Common negative stereotypes on older employees were: Older employees are less motivated, less willing to participate in training or learning, more resistant and less willing to change, less trusting, less healthy, and more vulnerable to challenges balancing work and family issues. However, the meta-analysis related to the topic showed that being less interested in training and career development was the only stereotype that was consistent with empirical evidence (Ng & Feldman, 2012). A survey of 420 American workers older than age of 50 examined the prevalence of perceived workplace discrimination. The researchers found that more than 80 percent of the participants experienced at least one discriminative treatment in the workplace within a year (Chou & Choi, 2011). These age discrimination and ageism behaviors in the workplace increase perceived age discrimination and anxiety about aging which can be negatively associated with job satisfaction, commitment, engagement in the workplace, and increase the desire to retire earlier (Macdonald & Levy, 2016; Zaniboni, 2015). North & Fiske (2016) found that older employees were facing intergenerational exclusion in work-related networking and provided scarce training spheres and resources. Moreover, loneliness and depression among older workers were predictors of work disability and transition into retirement (Morris, 2020; Segel-Karpas et al., 2018). Besides depression and loneliness, older workers may also provide care for loved ones, which affects their health and well-being. For example, Allen & Shockley. (2012) conducted a study examining the family issue of older workers and found there are issues such as obligations to care both for aging parents and children, caring for

grandchildren, and family influences on retirement decisions. Especially during the recent pandemic situation and follow-up recession, older adults are more vulnerable to social isolation and loneliness because older workers are likely to be isolated from the workplace and receive fewer age discrimination protections (Kanfer et al., 2020; Neumark & Button. 2014).

Considering the problematic social environment that older workers can experience, organizational efforts to protect older workers from age discrimination, education to reduce discrimination among workers, and social engagement among workers are needed.

Approaches to Enhance the Workplace Environment

Even though the population of older employees has increased, there are not enough programs or supports to provide a healthy and safe environment for older employees. Also, there should be specialized workplace wellness programs for older employees due to their unique circumstances and conditions (Hildt-Ciupińska & Bugajska, 2013). Workplace wellness programs not only affect older employees' working environment and work efficiency, but also positively affect workers' quality of life, overall health, and delay the age of retirement.

Health Promotion Program

According to the WHO Health Promotion Glossary (1998), "Health promotion is the process of enabling people to increase control over, and to improve their health.". Employers and organizations provide health promotion programs and facilities to their employees to enhance the overall health, work efficiency, engagement, and delay the retirement of workers. Most companies provide health-related wellness programs but the actual participation of employees in such programs is still limited (Mattke et al., 2013). In this section, we will look at the practice to offer a healthy environment among older adults and the effects of participating in those health promotion programs.

Poscia et al. (2016) and Crawford et al. (2010) conducted a systematic review of workplace health promotion on older adults and found that health promotion may reduce body weight, BMI, metabolic syndrome, help to change workers' behavior, provide safer workplace environment, and reduce the risk of early retirement. Cook et al. (2015) explored the effectiveness of Healthy Past50, which is an automated Web-based health promotion program for workers older than age of 50. The researcher found that the program provided health benefits to older workers by increasing short-term diet and exercise practices. A study among older workers in Taiwan showed that health promotion programs such as behavioral modifications to improve diet, stress management, and physical activity helped older workers to reduce body weight, waist circumference, BMI, and improved metabolic disorders (Chen et al., 2016). Hughes et al. (2011) compared two studies related to health promotion programs among older adults. Both studies entailed Web-based health risk assessments, but the first study provided personal coaching support, and the second study provided behavior-specific modules. Both studies showed benefits for diet and weight loss, but the first study had two times more participants who continued to use the program compared to the second study. Choi & Bum (2019) compared the quality of life and health of three groups of older adults, which were: 1) A group that only participated in physical leisure activity; 2) A group that only participated in work; 3) A group that both participated in physical leisure activity and work. The results showed that the third group showed the best status in self-esteem and the second group showed the lowest scores in social relationships and emotional states. These results indicate that older adults need a proper balance of working and physical activities to attain a better quality of life and health. Magnavita (2018) claims that it is necessary to educate older workers about health promotion programs, encourage more involvement with social partners, prevent occupational

risks such as exposure to toxic chemicals and noise, work-related stress, repetitive movements, strenuous efforts, and incorrect postures, and promote healthy lifestyles to make up for the lack of management and inflexibility in occupational health and safety system. Shephard (2000) argued that health promotion programs should attract older workers that are tailored to their needs and safety values. Older workers who are attracted to those factors are strongly motivated to enhance their physical health such as aerobic power, muscle strength, flexibility, and life expectancy. From the perspective of occupational health professionals, aging workers need health-related programs such as building a healthy lifestyle and personal relationships, individual work arrangements, a healthy working atmosphere, and proper leadership. Occupational health professionals can help older employees with health examinations, workplace visits, counseling, and organizing health-enhancing activities. (Naumanen, 2006). Pitt-Catsouphes et al. (2015) have discussed the workplace as an increasingly important environment that can effectively expand health promotion programs. They examine current knowledge of barriers and facilitators that may affect older workers' participation in workplace-based health and wellness programs, and propose new incentive structures to increase older workers' participation in these programs. They argue that utilizing the workplace as a health-promoting environment has the potential to be a powerful public health intervention that serves positive purposes from an individual, workplace, community, and societal perspective.

Literature Review Based on Theoretical Framework

Health Belief Model

In 1952, researchers such as Hochbaum and Rosenstock started to study the relationship between beliefs about human health behavior and health behavior performance to explain the failure of disease prevention programs. Based on their study, Hochbaum and his colleagues have

established the Health Belief Model (HBM) and it is still one of the most widely used conceptual frameworks in health behavior research. The key construction of HBM is to examine the motivation of individuals who participate or do not participate in taking action to prevent, to screen for, or to control illness conditions. These examinations include six factors which are susceptibility, seriousness, benefits, and barriers to a behavior, cues to action, and self-efficacy. Perceived susceptibility refers to the perception that one is at risk of getting a disease. It includes the likelihood of being diagnosed, of relapse, and of contracting the disease. Perceived severity is a perception that how seriously the patient is considering the condition and side effects of the disease. It includes medical consequences (disability, pain, death, etc.) and social consequences (work life, family life, family relationships, etc.). Perceived benefits include awareness of the benefits and benefits that can be obtained from performing a certain action. The possibility to perform certain actions increases when the patient thinks there are higher benefits from the action. Perceived benefits may include non-health-related perceptions, such as the financial savings related to quitting smoking or accessing certain areas after taking flu vaccine. Perceived barriers are recognition of negative aspects of certain proposed health behaviors. It includes cost burden, health risk, side effects, pain, discomfort, waste of time, etc. The more obstacles a person perceives to be caused by doing a certain behavior, the less likely he is to practice the behavior. Cues to action is behavioral trigger that can stimulate people to engage in specific behaviors. It includes personal education, counseling, postcards, public service advertisements, suggestions from trusted people, etc. Self-efficacy is a concept added by Bandura (1997), which defines the conviction that one can successfully execute the behavior required to produce the outcomes. By feeling self-efficacy, people can overcome the perceived barriers to take action. Other variables such as demographic variables (age, gender, race, etc.), socio-psychological variables

(personality, social status, etc.), and structural variables (disease knowledge, prior experience, etc.) can also influence perceptions of individual health belief. To summarize, we can expect people to participate in health-related activities in these situations: a) when the individual thinks there is a high possibility to have a health problem, b) when the health problem can occur serious problem to the individual, c) when the individual believes that their actions will reduce the likelihood or severity of the health problem, d) When we believe that the predicted benefits outweigh the barriers, e) When the individual has internal and external experiences to make them aware of the behavior and believe that they can perform the healthy behavior. (Hochbaum et al., 1952; Glanz et al., 2008; Rosenstock, 1974).

Activity Theory

Activity theory was first developed by Havighurst and Albrecht in 1953 which attempted to explain how people develop their lives in old age by using socially and psychologically approachment. The theory addresses how older people are best able to adapt to the changing circumstances of old age such as retirement, illness, loss of family and friends through death, etc. Activity theory is based on the assumption that older people have the same psychological and social needs as in middle age, except for inevitable changes in biological aspects and health. According to this theory, successful aging is ensured by the participation of older people in voluntary leisure organizations, childcare, and other forms of social interaction. Activity theory thus strongly avoids the sedentary lifestyle and recommends older adults remain in physically and socially active status. In other words, the higher the participation in social activities of the elderly, the higher the psychological satisfaction and life satisfaction, and the more positive self-concept. (Gillespie & Louw, 1993; Havighurst & Albrecht, 1953; Lemon et al., 1972)

A lot of research related to older adults' participation in social activity and the relationship of their life satisfaction was conducted based on Activity theory. Winstead et al. (2014) found out that activity participation among older adults can provide opportunities for self-identification, building social networks, role support, and occasion for social interaction, which are all important factors of successful aging. Hao (2008) found out that participating in paid work and volunteering helped older people to have better mental health compared to not participating in those activities. Pino et al., (2014) analyze the relationship between activity status and self-perceived health status among community-dwelling older adults and found out that the groups who are maintaining their work rated their health better than the retired group. Sloane-Seale & Kops (2008) suggests that the participation of older adult learners in educational activities can induce successful aging and potentially contribute to both physical and psychological well-being. Nimrod & Shrira (2016) found out that older adults group who engaged in high levels of leisure involvement showed increase in quality of life over time. On the other hand, nonactive respondents showed a decline in quality of life over time. These results can indicate that leisure participation can increase well-being of individuals throughout the later life course and act as a resource for resilience in old age.

Summary

To summarize, there is a prevalence of problematic workplace environments and individual limitations that can prevent older employees from working in a safe and healthy workplace. There have been some practices and trials to improve the current working environment and enhance older workers' overall health. However, most workplace wellness programs for older adults are not much different compared to general workplace wellness programs. Also, the studies were more likely to focus on the benefits of workplace wellness

programs for the company, rather than analyzing the actual effects of introducing workplace wellness programs among older adults. There should be further research and investments conducted in workplace wellness areas, especially for older employees. Also, due to the rapidly changing social system and issues, researchers should offer solutions that can be applied in the actual workplace environment which employs older workers. This study, therefore, attempts to fill these gaps in the literature by examining workplace wellness participation and outcomes based upon age groups.

CHAPTER 3: METHODS

The purpose of this study was to explore factors that shape older employees' participation in a workplace wellness program. Specifically, the study examined how age, health behaviors, presence or absence of chronic disease, job satisfaction, and absenteeism, and presenteeism were associated with participation in the iThrive workplace wellness program. Data was collected with an online survey that included questions about demographics, health behaviors, health status, job satisfaction, absenteeism and presenteeism, and adherence to the workplace wellness program activities. Adherence (i.e., participation rate) was measured by attendance records kept by the research team. The following research questions were examined: 1) What is the relationship between age and the frequency of engaging in health behaviors? 2) Is there a relationship between age and workplace wellness program participation? 3) Among the older aged groups, did the participants of the workplace wellness program have higher levels of job satisfaction, lower rates of absenteeism, and presenteeism compared to the control group (older adults who did not participate in the workplace wellness program)? 4) Among the older aged groups, is the presence or absence of chronic disease related to workplace wellness program participation?

Population and Sample

Data from the Illinois workplace wellness study was used for this research (Reif et al., 2020). The population examined for this randomized clinical trial consisted of 4,834 employees. Inclusion criteria were as follows: Must be employed at the University of Illinois at Urbana-Champaign in any of the following classifications: a) faculty, academic professional, civil service, facilities and services employees who are benefits eligible, b) Must be English speaking, c) Must be at least 18 years of age, d) Must consent to complete the survey and allow the research team to access their human resource and health insurance data.

Participants were randomly assigned to either the control group (n=1,534) or one of six treatment groups (n=3,300). Treatment groups varied based on the monetary incentives assigned to each group to encourage participation in the biometric screen and the wellness program activities. Amounts of incentives ranged from \$0 to \$200 depending on the group. Members of the treatment group completed a health risk assessment (HRA) survey and were given an option to participate in a variety of self-paced online or in-person wellness programs. The flow of participants in the Illinois workplace wellness study is illustrated in Figure 1. Examples of wellness programs include 1) adult recess for adults, 2) weight management, 3) stress management, 4) chronic disease self-management, 5) Tai Chi, and 6) Well at Work. Specifically, they were invited to choose one wellness program in the fall and one program in the spring. The control completed the baseline and follow-up surveys. All participants consented to the research team accessing their administrative data, which included measures of sick days taken, employment classification, and years worked at UIUC.

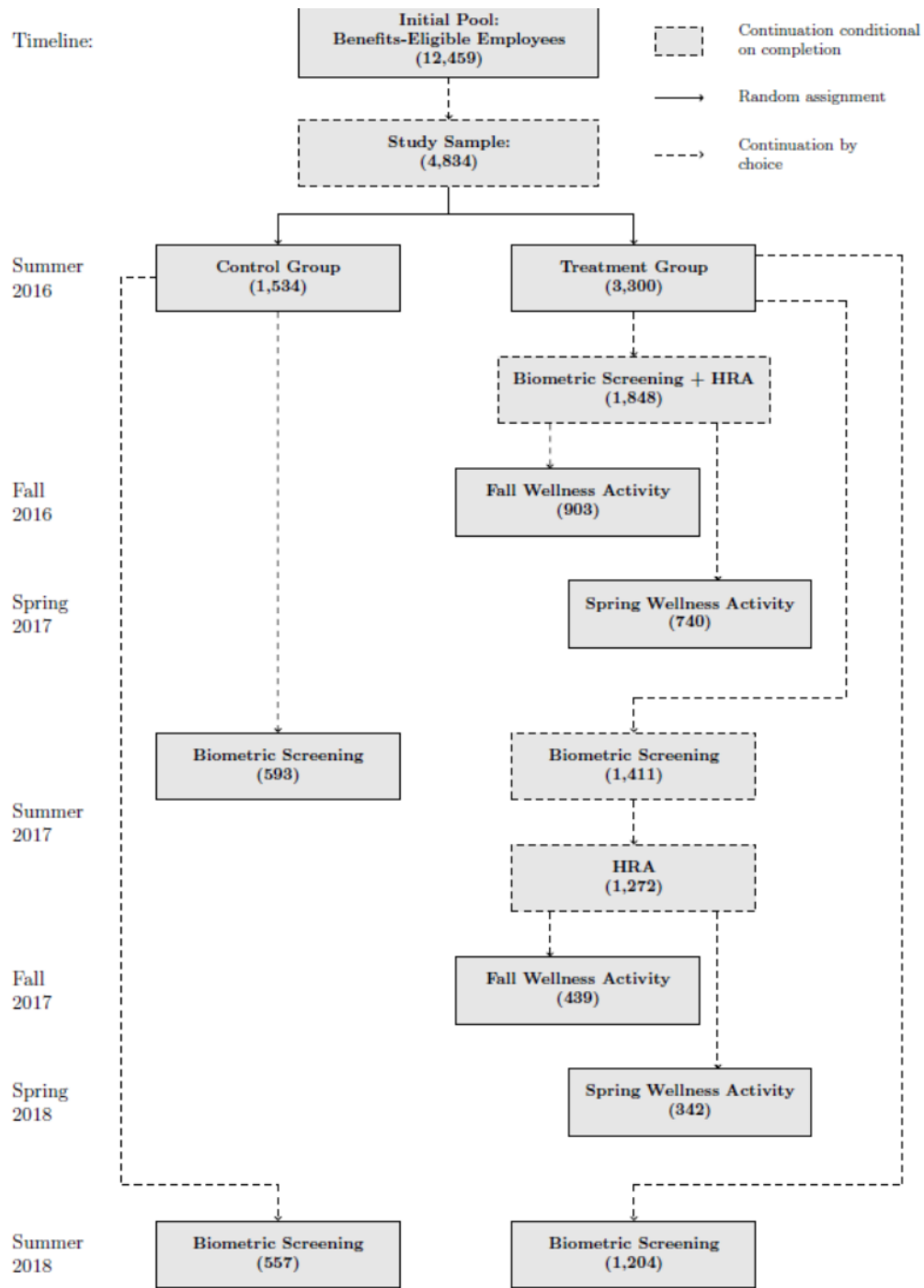


Figure 1. Flow of participants in the Illinois workplace wellness study (Reif et al., 2020)

Data Collection Procedures

In total, there were 12,459 employees who were eligible to participate (Figure 1). Participants were recruited through a postcard and email, which announced the study and invited them to participate in the study by completing a baseline survey, which was administered online via Qualtrics. The survey consisted of questions about self-reported health, health behaviors, workplace (e.g., job satisfaction, presenteeism, absenteeism), and demographic information. All 12,459 employees were invited to enter the study by completing the baseline survey. We have excluded 7,625 employees who did not complete the survey from the experiment. 4,834 employees were left as participants after the baseline survey procedure. Depending on the group, participants received monetary incentives ranging from \$0 to \$200. The response rate for the baseline survey was 38.8%. This response rate is higher than the average email survey response rate (30%) and online survey response rate (29%; Lindemann, 2019). After finishing the baseline survey, employees were assigned to either a control group or treatment group. Members of the treatment group were eligible to participate in a 2-year (from August 9, 2016, to April 26, 2018) comprehensive workplace wellness program (iThrive program) consisting of biometric screening, health risk assessment (HRA), and wellness activities. Control group employees were not eligible to participate in the first onsite biometric screening and short biometrics survey in August 2016 and were never eligible to participate in any of the HRAs or wellness activities offered throughout the 2-year iThrive program. After the intervention procedure was finished, both the treatment group and control group participated in follow-up surveys and health screening.

Measures

Most of the variables for this analysis are from the online survey and iThrive program participation records. Age was asked with an open-ended question where respondents recorded their age in years. Age was recoded into two age groups ages 37 to 49 and ages 50 and over.

Physical activity was measured with three questions. The first question asked “Compared with most people your age, would you say you are more physically active, less physically active, or about the same?” Answer categories included “more active”, “less active”, and “about the same.” Respondents were also asked if they are trying to increase their physical activity. Answer categories included “yes” and “no.” The last question in the physical activity section asked “In the last 12 months, have you been told by a doctor or health professional to increase your physical activity or exercise?” Answer categories included “yes” and “no.”

Cigarette smoking was measured with six questions. The first question asked “Have you smoked at least 100 cigarettes in your entire life?” Answer categories included “yes” and “no.” The second question asked “Do you now smoke cigarettes every day, some days, or not at all?” Answer categories included “Every day”, “Some days”, “Not at all.” The third question asked “During the last 4 weeks, on the days that you smoked, about how many cigarettes did you smoke per day? Your best estimate is fine.” Answer categories included “0”, “1-4”, “5-9”, “10-14”, “15-19”, “20 or more.” The fourth question asked “In the last 12 months, has a doctor or other health professional advised you to quit smoking?” Answer categories included “yes” and “no.” The fifth question asked “Have you tried to quit smoking in the last 12 months?” Answer categories included “yes” and “no.” The last question asked “How long ago did you quit smoking?” Answer categories included “Within the last year”, “Between 1 and 2 years ago”, “Between 2 and 3 years ago”, “More than 3 years ago.”

Alcohol consumption was measured with three questions. The first question asked “In the last 7 days, on how many days did you drink any type of alcoholic beverage?” Answer categories included “0”, “1”, “2”, “3”, “4”, “5”, “6”, “7.” The second question asked “In the last 7 days, on the days when you did drink alcohol, how many drinks did you usually have per day? One “drink” is a 12 ounce can of beer, a 5 ounce glass of wine, or a 1.5 ounce shot of liquor.” Answer categories included “0”, “1”, “2”, “3”, “4”, “5”, “6 or more.” The last question asked “In the last 7 days, on how many days did you have 4 or more drinks in one day? One “drink” is a 12 ounce can of beer, a 5 ounce glass of wine, or a 1.5 ounce shot of liquor.” Answer categories included “0”, “1”, “2”, “3”, “4”, “5”, “6”, “7.”

Participation in prior health screenings was measured with three questions. The first question asked “Have you ever had your cholesterol checked?” Answer categories included “yes” and “no.” The second question asked “Have you ever had a blood test for high blood sugar or diabetes, other than during pregnancy?” Answer categories included “yes” and “no.” The third question asked “Have you ever had a blood test for high blood sugar or diabetes?” Answer categories included “yes” and “no.”

Job satisfaction was measured with one question. The question asked “How satisfied are you with your job?” Answer categories included “Very satisfied”, “Somewhat satisfied”, “Somewhat unsatisfied”, “Very unsatisfied.” Absenteeism was measured with one question. The question asked “In the last 12 months, about how many days of work have you missed because of disability or poor health?” Answer categories included “0”, “1”, “2”, “3”, “4”, “5 or more.”

Presenteeism was measured with six statements based on the Stanford presenteeism scale (SPS-6); A screening that measures relationships between their health and work productivity (Koopman et al., 2002). Each statement was measured on a five-point Likert type scale from

“strongly disagree to strongly agree” and included the category “not applicable.” The first statement was “Despite having disability or poor health, I was able to finish hard tasks in my work.” The second statement was “At work, I was able to focus on achieving my goals despite disability or poor health.” The third statement was “Despite having disability or poor health, I felt energetic enough to complete all my work.” The fourth statement was “Because of disability or poor health, the stresses of my job were much harder to handle. The fifth statement was “My disability or poor health distracted me from taking pleasure in my work.” The sixth statement was “I felt hopeless about finishing certain work tasks, due to my disability or poor health.” Answer categories included “Strongly disagree”, “Somewhat disagree”, “Somewhat agree”, “Strongly agree”, “Not applicable.”

Chronic disease was measured with one question. The question asked “Have you ever been told by a doctor or other health professional that you have any of the following? Mark all that apply.” Answer categories included “diabetes”, “asthma”, “hypertension or high blood pressure”, “chronic back pain”, “high cholesterol”, “heart attack or heart disease”, “emphysema or chronic bronchitis (COPD)”, “congestive heart failure”, “weak or failing kidneys”, “cancer or a malignancy of any kind”, “depression or anxiety”, “arthritis”, “sinusitis or rhinitis”, “allergies” “other chronic condition: _____”, “ none of the above”. Respondents who marked more than one chronic condition were grouped as participants with chronic condition and respondents who marked none of the above were grouped as participants without chronic condition.

Adherence to the wellness program components was measured by the extent to which treatment group members completed the following iThrive program activities: 1) 2016 baseline biometric screening, 2) 2017 follow-up screening, 3) 2018 biometric screening; 4) 2017 Wellsource Health Risk Assessment (HRA); 5) Fall 2016 through spring 2018 (N= 4 semesters

of wellness program activities. To distinguish whether the participant completed or did not completed the wellness program, completers were assigned a value of 1 and non-completers were assigned 0.

Data Analysis

The data for this study has already been collected, coded, entered, and cleaned by the Illinois workplace wellness research team. The data consisted of the online survey and workplace wellness participation records. The online survey was coded according to its' question, answer categories, and correlation with research questions (e.g., health behavior, presenteeism, absenteeism, job satisfaction). For the wellness activity participation and health screening, the data was coded as; 0 = did not participate and 1 = completed the wellness activity/health screening.

I have conducted exploratory analyses examining the distribution of the data (frequencies, means, and standard deviations) and checked for outliers. Also, data was analyzed using SPSS to answer the research questions of interests. Since the study is cross-sectional and variables of interest were coded dichotomously, independent-sample t-tests and chi-squared tests were used to analyze the data.

CHAPTER 4: RESULTS

A total of 4,834 employees at the University of Illinois at Urbana-Champaign participated in the study. Three thousand and three hundred participants were assigned to the treatment group and 1,534 participants were assigned to control group. Among the participants, the gender ratio was 2,770 female (57.3%) and 2,064 male (42.7%; Table 1). The average age of participants was 43.9 years with a standard deviation of 11.3 years. The majority of the sample indicated they were white (83.7%). Among all 4,834 study participants, 2,121 (43.9%) were academic professionals, 963 (19.9%) were faculties, and 1,750 (36.2%) were civil service staffs and 1,172 (24.2%) earned less than \$40,000 per year. Please see table 1 for detailed background information of all the participants.

Of the 3,300 treatment group participants, 1,848 (56.0%) completed the biometric screen and the online HRA in the first year, and 1,036 (31.4%) completed at least one biometric assessment, the online HRA, or wellness activity in the first year. During the two-year program, 2,123 participants (64.3%) in the treatment group completed at least one component of the iThrive wellness program.

Table 1
Baseline Characteristics of the Study Population

Variable	Group, No.(%)	
	Treatment (n=3300)	Control (n=1534)
Age group, y		
<37	1125 (34.1)	516 (33.6)
37-49	1097 (33.2)	522 (34.0)
≥50	1078 (32.7)	496 (32.3)
Age, mean (SD), y	43.8 (11.3)	44.0 (11.4)
Gender		
Male	1411 (42.8)	653 (42.6)
Female	1889 (57.2)	881 (57.4)
Race/ethnicity		
White	2758 (83.6)	1290 (84.1)
Nonwhite	542 (16.4)	244 (15.9)
Annual salary, \$		
<40,000	798 (24.2)	374 (24.4)
40,000 to <50,000	660 (20.0)	327 (21.3)
50,000 to <75,000	1090 (33.0)	469 (30.6)
≥75,000	752 (22.8)	364 (23.7)
Employee class		
Faculty	662 (20.1)	301 (19.6)
Academic professional	1442 (43.7)	679 (44.3)
Civil service	1196 (36.2)	554 (36.1)
Insurance claims subsample		
Medical diagnosis		
Type 1 and 2 diabetes	106/2184 (4.9)	66/1033 (6.4)
Hypertension	289/2184 (13.2)	151/1033 (14.6)
Hyperlipidemia	337/2184 (15.4)	171/1033 (16.6)
Medical use, mean (SD), d		
Office or outpatient visit	2.4 (2.6)	2.7 (2.8)
Inpatient visit	0.1 (1.1)	0.1 (0.4)
Emergency department visit	0.1 (0.5)	0.1 (0.4)

Research question 1. What is the relationship between age and the frequency of engaging in health behaviors?

An independent-samples t-test was conducted to examine the relationship between age and the frequency of engaging in health behaviors. The sample was classified into two groups according to age (Table 2). The first group included participants aged 50 and over and the other group was comprised of participants under 50 years old. First, health behaviors from the online survey were recoded into dichotomous variables. Items for the health behaviors included four categories, which are heavy drinking, current smoker, health screening, and physical activity (Heavy drinker = 0, Non heavy drinker = 1, Current smoker = 0, Nonsmoker = 1, Did not have at least 1 previous health screening = 0, Had at least 1 previous health screening = 1, Not physically active = 0, Physically active = 1). A summative variable was calculated from the health behavior categories to create a composite score for health behaviors where a higher score is a higher frequency of engaging in these health behaviors.

The results indicated a statistically significant relationship between age and the frequency of engaging in health behaviors; $t = 9.83$, $F = 6.839$, $p \leq .001$, Table 3). The 50 and over age group scored significantly higher ($M = 3.31$, $SD = 0.63$) than the under 50 group ($M = 3.07$, $SD = 0.70$) on the composite health behavior score. Specifically, our results suggest that as people age, they tend to engage in health behaviors such as participating in health screening and physical activity, and avoiding heavy drinking and smoking.

Table 2*Group Statistics*

	Age group 50 and over	N	Mean	Std. Deviation	Std. Error Mean
Health Behavior Score	50 and over	1570	3.3096	.62839	.01586
	under 50	3258	3.0691	.70340	.01232

Table 3*Independent Samples Test*

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	Lower	Upper
						One-Sided p	Two-Sided p				
Health Behavior Score	Equal variances assumed	6.839	.009	9.827	3292	<.001	<.001	.248	.025	.199	.298
	Equal variances not assumed			10.300	2400.269	<.001	<.001	.248	.024	.201	.296

Table 4*Independent Samples Effect Sizes*

		95% Confidence Interval			
		Standardizer ^a	Point Estimate	Lower	Upper
Health Behavior Score	Cohen's d	.67992	.354	.293	.414
	Hedges' correction	.68003	.354	.293	.414
	Glass's delta	.70340	.342	.281	.403

a. The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation, plus a correction factor.

Glass's delta uses the sample standard deviation of the control group.

Research question 2. Is there a relationship between age and workplace wellness program participation?

Chi-square tests were conducted to examine the relationship between age and workplace wellness program participation (Tables five through twelve). Workplace wellness participation rate of each age group was analyzed according to four-time periods, which were fall 2016, spring 2017, fall 2017, spring 2018. For all four study periods (i.e., fall 2016, spring 2017, fall 2017, and spring 2018), there was no significant association between age and workplace wellness program participation.

Table 5*Age group 50 and over * Completed Fall 2016 activity*

		Completed Fall 2016 activity			
		Did not completed Fall 2016 activity	Completed Fall 2016 activity	Total	
Age group 50 and over	under 50	Count	1604	618	2222
		% within Age group 50 and over	72.2%	27.8%	100.0%
		% of Total	48.6%	18.7%	67.3%
		Standardized Residual	-.2	.4	
	50 and over	Count	793	285	1078
		% within Age group 50 and over	73.6%	26.4%	100.0%
		% of Total	24.0%	8.6%	32.7%
		Standardized Residual	.4	-.6	
Total		Count	2397	903	3300
		% within Age group 50 and over	72.6%	27.4%	100.0%
		% of Total	72.6%	27.4%	100.0%

Table 6*Chi-Square Tests*

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.690 ^a	1	.406		
Continuity Correction ^b	.623	1	.430		
Likelihood Ratio	.693	1	.405		
Fisher's Exact Test				.429	.215
Linear-by-Linear Association	.690	1	.406		
N of Valid Cases	3300				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 294.98.

b. Computed only for a 2x2 table

Table 7*Age group 50 and over * Completed Spring 2017 activity*

		<u>Completed Spring 2017 activity</u>			
		Did not completed	Completed Spring	Total	
		Spring 2017	2017 activity		
		activity			
Age group 50 and over	under 50	Count	1712	510	2222
		% within Age group 50 and over	77.0%	23.0%	100.0%
		% of Total	51.9%	15.5%	67.3%
		Standardized Residual	-.3	.5	
50 and over		Count	848	230	1078
		% within Age group 50 and over	78.7%	21.3%	100.0%
		% of Total	25.7%	7.0%	32.7%
		Standardized Residual	.4	-.8	
Total		Count	2560	740	3300
		% within Age group 50 and over	77.6%	22.4%	100.0%
		% of Total	77.6%	22.4%	100.0%

Table 8*Chi-Square Tests*

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.090 ^a	1	.296		
Continuity Correction ^b	.999	1	.317		
Likelihood Ratio	1.097	1	.295		
Fisher's Exact Test				.306	.159
Linear-by-Linear Association	1.090	1	.296		
N of Valid Cases	3300				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 241.73.

b. Computed only for a 2x2 table

Table 9*Age group 50 and over * Completed Fall 2017 activity*

			Completed Fall 2017 activity		
			Did not completed Fall 2017 activity	Completed Fall 2017 activity	Total
Age group 50 and over	under 50	Count	1940	282	2222
		% within Age group 50 and over	87.3%	12.7%	100.0%
		% of Total	58.8%	8.5%	67.3%
		Standardized Residual	.3	-.8	
50 and over	50 and over	Count	921	157	1078
		% within Age group 50 and over	85.4%	14.6%	100.0%
		% of Total	27.9%	4.8%	32.7%
		Standardized Residual	-.4	1.1	
Total		Count	2861	439	3300
		% within Age group 50 and over	86.7%	13.3%	100.0%
		% of Total	86.7%	13.3%	100.0%

Table 10*Chi-Square Tests*

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.207 ^a	1	.137		
Continuity Correction ^b	2.048	1	.152		
Likelihood Ratio	2.179	1	.140		
Fisher's Exact Test				.140	.077
Linear-by-Linear Association	2.207	1	.137		
N of Valid Cases	3300				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 143.41.

b. Computed only for a 2x2 table

Table 11*Age group 50 and over * Completed Spring 2018 activity*

		<u>Completed Spring 2018 activity</u>			
		Did not completed	Completed Spring	Total	
		Spring 2018	2018 activity		
		activity			
Age group 50 and over	under 50	Count	1994	228	2222
		% within Age group 50 and over	89.7%	10.3%	100.0%
		% of Total	60.4%	6.9%	67.3%
		Standardized Residual	.1	-.2	
50 and over		Count	964	114	1078
		% within Age group 50 and over	89.4%	10.6%	100.0%
		% of Total	29.2%	3.5%	32.7%
		Standardized Residual	-.1	.2	
Total		Count	2958	342	3300
		% within Age group 50 and over	89.6%	10.4%	100.0%
		% of Total	89.6%	10.4%	100.0%

Table 12*Chi-Square Tests*

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.077 ^a	1	.781		
Continuity Correction ^b	.047	1	.828		
Likelihood Ratio	.077	1	.782		
Fisher's Exact Test				.808	.412
Linear-by-Linear Association	.077	1	.781		
N of Valid Cases	3300				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 111.72.

b. Computed only for a 2x2 table

Research question 3. Among the treatment group consisting of employees 50 and older, did workplace wellness program participants have higher levels of job satisfaction and lower rates of absenteeism and presenteeism compared to the control group (i.e., older adults who did not participate in the workplace wellness program)?

Independent-samples t-test and chi-square tests were conducted to examine whether the treatment group had higher levels of job satisfaction and lower rates of absenteeism, and presenteeism compared to the control group. Survey questions were recoded into level of job satisfaction, rates of absenteeism, and presenteeism to analyze the behavior and perception change in workplace behavior among workplace wellness program participants.

Chi-square tests were used to analyze measures of job satisfaction, absenteeism and presenteeism. Regarding, job satisfaction, the results show no significant association between workplace wellness program participation and job satisfaction, $X^2 (1, N = 939) = 0.44, p = 0.834$ (Table 13, 14). For absenteeism, the results show no significant difference in absenteeism between the control and treatment group, $X^2 (1, N = 939) = 1.865, p = 0.172$ (Tables 15-16). For presenteeism, independent-samples t-test were used for the analysis. There was also no significant difference in presenteeism scores between the treatment group ($M = 24.41, SD = 7.207$) and control group ($M = 23.71, SD = 7.412$); $t (938) = -1.394, one\ sided\ p = 0.82$ (Table 17-18).

These results suggest there are no significant differences between the treatment and control groups for job satisfaction, absenteeism, and presenteeism by age group (50+ and under 50 years).

Table 13*Both groups * Very satisfied with job (2018) Crosstabulation*

		Very satisfied with job (2018)			
		Not very satisfied with job (2018)	Very satisfied with job (2018)	Total	
Both groups	control	Count	159	159	318
		% of Total	16.9%	16.9%	33.9%
	treat	Count	315	306	621
		% of Total	33.5%	32.6%	66.1%
Total		Count	474	465	939
		% of Total	50.5%	49.5%	100.0%

Table 14*Chi-Square Tests*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.044 ^a	1	.834		
Continuity Correction ^b	.020	1	.888		
Likelihood Ratio	.044	1	.834		
Fisher's Exact Test				.836	.444
Linear-by-Linear Association	.044	1	.834		
N of Valid Cases	939				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 157.48.

b. Computed only for a 2x2 table

Table 15*Both groups * Absenteeism (i.e., number of sick days in past 12 months) Crosstabulation*

		Sick days in past 12 months (2018)			
		Does not have sick days in past 12 months (2018)	Have sick days in past 12 months (2018)	Total	
Both groups	control	Count	125	193	318
		% of Total	13.3%	20.6%	33.9%
	treat	Count	273	348	621
		% of Total	29.1%	37.1%	66.1%
Total		Count	398	541	939
		% of Total	42.4%	57.6%	100.0%

Table 16*Chi-Square Tests*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.865 ^a	1	.172		
Continuity Correction ^b	1.679	1	.195		
Likelihood Ratio	1.872	1	.171		
Fisher's Exact Test				.185	.097
Linear-by-Linear Association	1.863	1	.172		
N of Valid Cases	939				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 134.79.

b. Computed only for a 2x2 table

Table 17*SPS-6 Group Statistics*

	Both groups	N	Mean	Std. Deviation	Std. Error Mean
SPS-6 (Stanford Presenteeism Scale, range 6-30) (2018)	treat	622	24.41	7.207	.289
	control	318	23.71	7.412	.416

Table 18*Independent Samples Test*

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Side	Two-Side			Lower	Upper
SPS-6 (Stanford Presenteeism Scale, range 6-30) (2018)	Equal variance assumed	3.430	.064	1.394	938	.082	.164	.699	.502	-.285	1.684
	Equal variance not assumed			1.381	623.190	.084	.168	.699	.506	-.295	1.693

Research question 4. Among the older aged group (i.e., participants 50 and older), is the presence or absence of chronic disease related to workplace wellness program participation?

Chi-square tests were conducted to examine the association between chronic disease status and participation in the workplace wellness program. Workplace wellness participation was analyzed according to four time-periods, which are fall 2016, spring 2017, fall 2017, spring 2018. The chronic disease question in the online survey was answered for four consecutive semesters, as noted above.

Fall 2016 wellness activity participation rates shows there was no significant association between chronic disease status and participation in workplace wellness program, $X^2(1, N = 1078) = 2.015, p = 0.156$ (Table 19, 20). Moreover, this finding was consistent for Spring 2017 ($X^2(1, N = 746) = 0.697, p = 0.404$), fall 2017 ($X^2(1, N = 746) = 1.306, p = 0.253$), and spring 2018 ($X^2(1, N = 622) = 3.358, p = 0.067$). Thus across all four semesters, there was no significant association between chronic disease status and participation in workplace wellness program (Table 21, 22).

Table 19*Has at least 1 chronic condition (2016) * Completed Fall 2016 activity Crosstabulation*

		Completed Fall 2016 activity			
			Did not completed Fall 2016 activity	Completed Fall 2016 activity	Total
Has at least 1 chronic condition (2016)	Did not has at least 1 chronic condition (2016)	Count	119	53	172
		% of Total	11.0%	4.9%	16.0%
	Has at least 1 chronic condition (2016)	Count	674	232	906
		% of Total	62.5%	21.5%	84.0%
Total		Count	793	285	1078
		% of Total	73.6%	26.4%	100.0%
		Total			

Table 20*Chi-Square Tests*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.015 ^a	1	.156		
Continuity Correction ^b	1.756	1	.185		
Likelihood Ratio	1.963	1	.161		
Fisher's Exact Test				.158	.094
Linear-by-Linear Association	2.013	1	.156		
N of Valid Cases	1078				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 45.47.

b. Computed only for a 2x2 table

Table 21*Has at least 1 chronic condition (2017) * Completed Spring 2017 activity Crosstabulation*

		Completed Spring 2017 activity			
			Did not completed Spring 2017 activity	Completed Spring 2017 activity	Total
Has at least 1 chronic condition (2017)	Did not has at least 1 chronic condition (2017)	Count	87	43	130
		% of Total	11.7%	5.8%	17.4%
	Has at least 1 chronic condition (2017)	Count	435	181	616
		% of Total	58.3%	24.3%	82.6%
Total		Count	522	224	746
		% of Total	70.0%	30.0%	100.0%
		Total			

Table 22*Chi-Square Tests*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.697 ^a	1	.404		
Continuity Correction ^b	.532	1	.466		
Likelihood Ratio	.687	1	.407		
Fisher's Exact Test				.402	.232
Linear-by-Linear Association	.696	1	.404		
N of Valid Cases	746				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 39.03.

b. Computed only for a 2x2 table

Table 23*Has at least 1 chronic condition (2017) * Completed Fall 2017 activity Crosstabulation*

		Completed Fall 2017 activity			
			Did not completed Fall 2017 activity	Completed Fall 2017 activity	Total
Has at least 1 chronic condition (2017)	Did not has at least 1 chronic condition (2017)	Count	98	32	130
		% of Total	13.1%	4.3%	17.4%
	Has at least 1 chronic condition (2017)	Count	492	124	616
		% of Total	66.0%	16.6%	82.6%
Total		Count	590	156	746
		% of Total	79.1%	20.9%	100.0%
		Total			

Table 24*Chi-Square Tests*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.306 ^a	1	.253		
Continuity Correction ^b	1.049	1	.306		
Likelihood Ratio	1.265	1	.261		
Fisher's Exact Test				.285	.153
Linear-by-Linear Association	1.304	1	.253		
N of Valid Cases	746				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 27.18.

b. Computed only for a 2x2 table

Table 25*Has at least 1 chronic condition (2018) * Completed Spring 2018 activity Crosstabulation*

		Completed Spring 2018 activity			
			Did not completed Spring 2018 activity	Completed Spring 2018 activity	Total
Has at least 1 chronic condition (2018)	Did not has at least 1 chronic condition (2018)	Count	72	22	94
		% of Total	11.6%	3.5%	15.1%
	Has at least 1 chronic condition (2018)	Count	445	83	528
		% of Total	71.5%	13.3%	84.9%
Total		Count	517	105	622
		% of Total	83.1%	16.9%	100.0%
		Total			

Table 26*Chi-Square Tests*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.358 ^a	1	.067		
Continuity Correction ^b	2.833	1	.092		
Likelihood Ratio	3.124	1	.077		
Fisher's Exact Test				.073	.050
Linear-by-Linear Association	3.353	1	.067		
N of Valid Cases	622				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.87.

b. Computed only for a 2x2 table

CHAPTER 5: DISCUSSION

The objectives of this study were to: 1) Examine the relationship between age group (50+ and under 50) and the frequency of engaging in health behaviors; 2) Examine the relationship between age group and workplace wellness program participation; 3) Compare the control and treatment groups on measures of job satisfaction, absenteeism, and presenteeism; and 4) Examine the relationship between chronic disease status and workplace wellness program participation among older workers.

While there were only a few significant findings from the analysis, the general trends of the motivational and behavioral factors of older employees can inform researchers and practitioners to better understand why older employees participate in workplace wellness programs and how the program can facilitate their health and well-being.

Further, the study contributes to the literature by providing data on within-group comparisons that focus on older employees who participated in this workplace wellness program. The findings from this study offer insights into the potential role of workplace wellness programs in shaping health behaviors, absenteeism, presenteeism and job satisfaction among younger and older employees.

Several findings were surprising and interesting relative to the existing literature on health and well-being effects of workplace wellness programs. From this study, I found that as employees age, they tend to engage more in healthy behaviors like health screening and physical activity and avoid unhealthy behaviors such as heavy drinking and smoking. Also, in this sample, there was no relationship between age and workplace wellness program participation rate, nor was there a relationship between the older-aged control group and treatment group for level of job satisfaction, absenteeism, and presenteeism. Finally, there was also no association

between chronic disease status (i.e., having 1 or more chronic conditions or not having a chronic condition) and participation rate in the workplace wellness program among older aged groups.

Some of the research findings were consistent with previous research conducted based on workplace wellness programs, but some were not consistent with existing literature. I have divided findings into four categories: 1) Age and health behavior; 2) Age and workplace wellness program participation; 3) Differences between the treatment and control group related to perceptions on workplace satisfaction and productivity (i.e., absenteeism and presenteeism); and 4) Chronic disease status and workplace wellness program participation. I will discuss the extent to which the research findings are consistent or inconsistent with previous research and discuss possible reasons for these findings. Then will I discuss theoretical and practical implications of the results, limitations of the study, and provide suggestions for future research.

Age and Health Behavior

When we compared to the control group by age groups (over 50 / under 50) I found that the group over 50 was engaging in health behavior more frequently than the under 50 group. The health behavior criteria included healthy behaviors such as preventive health screenings, physical activity (including leisure-time physical activity) and less frequent heavy drinking and smoking. This suggests that, as employees' age, they tend to practice health behaviors more often and try to pursue a healthy lifestyle while avoiding unhealthy behaviors.

This may be due to the increase in the perceptions among older adults regarding their health status and subjective well-being (Zanjani et al., 2006). Factors that shape health behavior in older adults may come from engaging in behaviors motivated by striving for personal growth, aspirations, and adhering to risk reduction (O'Donnell, 2008).

These findings are consistent with the previous research of Mata et al. (2011). These researchers compared risk-seeking and risk-avoidant behavior of young and older adults and found that older adults were more risk-averse when engaging in activities like social relationships, sexual behavior, and recreational activities. This result might explain why older employees avoid unhealthy behaviors. Moreover, Nigg et al. (1999) investigated the stage distribution of 10 healthy behaviors (i.e., using seatbelts, avoiding fat, eating fiber, losing weight, exercising, avoiding sun, using sunscreen, avoiding stress, smoking, self-examining cancer) among older adults. The majority of these older adults were found to be in either precontemplation or maintenance, illustrating the need to target health behavior change interventions to precontemplation. Considering this result, older adults can build positive health behaviors by participation in community health promotion programs and interventions.

Even though age is an important variable for engaging in health behavior, other variables such as gender, education, socioeconomic status, health insurance, race, support system, routine practice of religion, medical problems, marital status, health literacy, executive function, self-efficacy, and a number of children among older adults should be considered to evaluate and predict the engagement of health behavior among older adults (Brown et al., 1986; Callaghan et al., 2005; McAuley et al., 2011; Shankar et al., 2010; Wolf et al., 2007).

Also, the result of the research question are based on composite score (total score composed of heavy drinking, current smoker, health screening, and physical activity), so the difference may not be consistent for the individual behaviors. Specifically, other research suggests that people are less physically active with age (Eime et al., 2016; Meisner et al., 2010; Woods, 2017).

Age and Workplace Wellness Program Participation

To examine the relationship between age and workplace wellness program participation, we have divided the age group into two groups. The first group included participants aged 50 and over 50. The second group included participants aged under 50. We have analyzed the participation rate of four-time periods which are fall 2016, spring 2017, fall 2017, spring 2018. As we have compared the participation rate in both groups, the results suggest that there is no relationship between age and workplace wellness program participation.

Even though we can see that older employees engage more in health behavior from the first theme, it doesn't ensure that such health behavior can lead older employees to engage in workplace wellness programs. The reason for the low participation rate in workplace wellness programs might be coming from barriers such culture, environment, worksite characteristics, employee interest and involvement, established wellness culture, awareness, accessibility, insufficient motivation, inconvenient locations, time limitations, lack of interest in wellness program, schedule conflicts and health beliefs (Warehime et al., 2019; Person et al., 2010). Older employees even face additional including impaired health, fear of injury, negative attitudes toward exercise, and limited knowledge of the benefits of exercise (Miller, 2009).

We have found recommendations to induce higher participation rate in workplace wellness programs among older adults. Magnavita (2018) argued that disseminating knowledge of health-promoting effects to older workers, encouraging workers' participation with their social partners, adopting an integrated approach, and combining the prevention of occupational risks and the promotion of healthy lifestyles is the key to overcome the obstacles inside the workplace wellness program. Tringali & Aldridge (2021) claimed that physical activity climate and health beliefs should be emphasized to promote workplace physical activity program participation

among older employees. Shephard (2000) found out that older employees were attracted to workplace wellness programs when they perceive the program as safe and adapted to their needs.

Workplace Wellness Program Participation and Perceptions of the Workplace

As we have examined the level of job satisfaction, absenteeism, and presenteeism among older-aged control group and treatment group, we did not find any significant relationship with workplace wellness participation and perception of the workplace (level of job satisfaction, presenteeism, and absenteeism). Before we discuss the results, explaining concepts of absenteeism and presenteeism will help us understand better with the relationship between workplace wellness and perception of the workplace.

Job satisfaction is defined as a pleasurable or positive emotional state resulting from the appraisal of one's job or job experience. They are the result of employees' perception of how well their job provides those things that are viewed as important. Job satisfaction occurs when an employee feels accomplishment on something that has importance and value to his organization and is worthy of recognition (Mitchell & Lasan, 1987; Thompson, 2012).

Absenteeism is defined as unplanned employee absences to work due to the unexpected situations of the employee. Possible causes for absenteeism are sickness, injuries, depression, stress, family care, etc. Absenteeism has long been a preoccupation of organizations and one of the oldest research topics in the field of work and organizational psychology because absenteeism can cause decreased productivity, negative effects on company finances, morale, and other factors. However, absenteeism is a multiple and complex phenomenon that requires substantial investigation (Harrison et al., 2003; Munro, 2007; Johns, 2003)

Presenteeism is defined as the phenomenon that occurs when employees are present at work, but they're not doing their job or being productive. This occurs when employees decide to

work even when they are sick or don't feel fully functioning. Presenteeism is hard to quantify because, while employees show up for work, and might even outwardly look fine, underlying health issues might be driving down their motivation and productivity. Whereas at first presenteeism was regarded as marginal and found only in a minority of workers, studies now reveal a more widespread phenomenon. Significant numbers of workers come to work ill and presenteeism manifests itself indiscriminately across occupational groups resulting in substantial productivity losses (Dew et al., 2005; Goetzel et al., 2004; Gosselin et al., 2013)

The results of this study were not consistent with previous research on absenteeism and workplace health promotion programs. Aldana et al., (2005) conducted a two-year period study examining the impact of Washoe County School District Wellness Program on employee health care costs and rates of absenteeism. The researchers did not find significant differences in health care cost but have found that program participants had an average of three fewer days of being absent to work. Bertera, (1990) also found that workplace health promotion program participation significantly reduced absent workdays of the employees (14.0 percent decline on absent days for workplace which participated in the program, 5.8 percent decline on absent days for control workgroup) and saved lower disability costs at intervention sites offset program costs in the first year, and provided a return of \$2.05 for every dollar invested in the program by the end of the second year.

The results of this study were also not consistent with previous research on job satisfaction and workplace health promotion programs. Williams et al., (2018) conducted a cross-sectional survey on nurses working in an acute care community hospital to explore the relationships between nurse-reported health-promoting behaviors (HPBs), job stress, and job satisfaction in a hospital setting. Researchers found out that higher levels of HPB were

associated with lower job stress and higher job satisfaction. Ledikwe et al., (2018) conducted a survey using multistage sampling distributed to 1856 randomly selected healthcare workers at 135 public facilities across Botswana. They have examined the relationship between Botswana's Workplace Wellness Program participation and job satisfaction, occupational stress, well-being, and burnout. The results showed that workplace wellness activities participation is associated with higher satisfaction with multiple job facets and lower stress, exhaustion, and cynicism. Naumanen, (2006) have analyzed group essays from 16 occupational health professionals who had participated in the Health Promotion Project of Aging Workers in Finland to find out the impact of health promotion activities for older workers. They have found out that health promotion activities were positively impacting health, productivity, and work satisfaction.

Some of the previous research was consistent with the result we found on workplace wellness and presenteeism relationship and some were not consistent with. Brown et al., (2011) conducted an article review on relationships between physical activity and employee well-being and presenteeism in the workplace. They have found that physical activity and employee psychosocial health are positively related, but they did not find a significant relationship between physical activity and presenteeism. Cancelliere et al., (2011) conducted a systematic review on the effectiveness of workplace health promotion programs on improving presenteeism in workplace. Researchers found out that there is preliminary evidence that some WHP programs can positively affect presenteeism. However, they also argue that the presenteeism literature needs more standard presenteeism metrics and studies conducted across a broad range of workplace settings since the subject is young and heterogeneous. Schmidt et al., (2020) found out that companies can protect their employees from the negative effects including job insecurity and presenteeism by establishing workplace health promotion programs in workplace.

Some recommendations were found from the previous studies for enhancing workplace perception. Ammendolia et al., (2016) suggest that an intervention mapping approach can develop a workplace health promotion and wellness program aimed at reducing presenteeism. Intervention Mapping is a planning approach that is based on using theory and evidence as foundations for taking an ecological approach to assess and intervene in health problems and engendering community participation. They follow six procedures to care for certain problems in the workplace. The steps are; 1) set the logic model of the problem, 2) evaluate the program outcomes and objectives, 3) program design, 4) program production, 5) program implementation plan, 6) evaluation plan. The researchers argue that intervention mapping and collaborating with a workplace partner was successful to reduce presenteeism by improving their current health promotion and wellness program. The process compelled participants to think critically and collaboratively and often in non-traditional ways.

Chronic Disease Status and Workplace Wellness Program Participation

To examine whether the presence or absence of chronic disease affects workplace wellness program participation among older workers, we have divided the older age group who participated in workplace wellness programs. The groups were divided into two groups depending on having at least one chronic condition or not having at least one chronic condition. The study result showed that there is no correlation between chronic disease status and participation rate in workplace wellness programs among older-aged groups.

These findings are consistent with previous research of Tkatch et al., (2018). They conducted a qualitative study interviewing 32 older adults to identify older adults on three levels of health status (healthy and active, managing diseases, or very sick) to better understand how health is defined and maintained. Five themes were analyzed through thematic analysis which

are: disconnectedness between objective and subjective health, health defined to include psychological and social components, resilience and coping mechanisms indicative of successful aging; social support systems integral to health, and the goal of maintaining functioning. The result showed that individual perceptions of health are more important than the existence of chronic diseases. This indicates that health promotion programs should provide holistic approaches to maximize health outcomes and promote successful aging. Magnavita, (2018) also gives examples of the reality of health promotion programs in Italy which are highly focused on medical examination and routine check-ups but not much focused on actual health promotion programs. The author suggests that health management programs should target overall health rather than certain disease.

Some recommendations to promote older adults who have chronic conditions to participate in a workplace wellness program can be found in previous studies. Although there are only a handful of digital health coaching programs and studies for older employees, researchers argue that automated forms of digital health coaching can contribute to improved patient self-management while reducing costs due to increased scalability and availability of the use of human health coaches (Van et al., 2016). Irvine et al., (2013) evaluated the efficacy of a 12-week web-based intervention to help sedentary older adults adopt and maintain an exercise regimen. At 6 months, treatment participants maintained large gains compared to the control participants on all 14 outcome measures (cardiovascular activities, stretching activities, strengthening activities, balance activities, time involved in activities, SF-12 physical, SF-12 mental, BMI, attitudes and knowledge on physical activity, self-efficacy, behavioral intentions, motivation to exercise, ability to exercise, barriers to exercise).

Theoretical Implications

In this study, the Health Belief Model (Hochbaum et al., 1952; Rosenstock, 1974) and Activity Theory (Havighurst, 1963) were adopted as conceptual frameworks for data analysis. The Health Belief Model (HBM) was used to explore the relationship between beliefs about human health behavior and health behavior performance. HBM's key role is to examine the motivation of individuals who participate or do not participate in taking action to prevent, screen for, or control illness conditions. Findings from the first research question align with the concepts of HBM. Results indicated that the older employee group was more engaged in health behaviors than the young employee group (RQ #1). The result of the first question provides support for the HBM in that the results could be shaped by the increase in these older workers' health perceptions and beliefs, which then shaped their health behaviors and health status (Hochbaum et al., 1952; Glanz et al., 2008; Rosenstock, 1974). However, other findings from the study do not support the HBM since there was no statistically significant relationship between workplace (i.e., absenteeism, presenteeism), job satisfaction, wellness participation rate, and chronic disease status (i.e., have 1 or more, do not have any chronic conditions) with workplace wellness program participation.

The main theme of Activity Theory is that in order to increase psychological well-being and life satisfaction, and to pursue successful aging, older people should avoid sedentary lifestyles, and stay physically and socially active (Brown, 2015; Havighurst, 1963). In this analysis of older workers, there were no significant associations between workplace wellness program participation and measures of health and well-being. Thus, these findings do not align with Activity Theory.

Practical Implications

It is important to examine the findings in the context of professional practice as it pertains to the design and implementation of workplace wellness programs. Even though extant research emphasizes the positive impacts of workplace wellness programs for employees' health and work efficiency, the results from this study mostly do not support the actual positive impacts of workplace wellness programs, especially among older adults. These results suggest that participation in a workplace wellness program is not associated with older employees workplace satisfaction and performance indicators (i.e., presenteeism, and absenteeism). However, as the results indicate, older employees self-reported significantly more frequent engagement in health behaviors than the under 50 age group in the sample. If older employees can have access to adequate workplace wellness programs, which are designed to facilitate their health status, job satisfaction and performance, workplace wellness could go a long way toward facilitating the health behavior change (and health behaviors) and health benefits of workers who are 50 years of age and older.

Therefore, health and wellness professionals and researchers who aim to enhance the positive effects and workplace wellness participation should provide adequate wellness programs that are tailored to older employees' characteristics, needs and preferences. Moreover, since none of the research questions pertaining to the under 50 year old workers were supported, more attention should be placed on designing workplace wellness initiatives that specifically meet the needs and preferences of younger and middle aged workers. Besides, it is likely these middle aged and younger adults have many family responsibilities (e.g., raising children and grandchildren, caring for older family members, dual-income and single-income households, etc.). Further analysis of this data could consider household size and caregiving responsibilities

to see if that affected workplace wellness participation, absenteeism and presenteeism, along with job satisfaction. Additionally, it is important to ensure all employees are given paid time off to participate in workplace wellness programs.

Including this study, many studies are focused on workplace wellness programs where employees are expected to participate in the wellness program before or after their work time (Dailey et al., 2018; Litchfield et al., 2016; Mattke et al., 2013). Breaking those boundaries may help employees increase their participation in wellness programs and reduce pressure, and stress in the workplace. Furthermore, after the COVID-19 pandemic, the work-from-home environment has become more widespread through workplace environments. Wellness programs that adapt to this environment may be able to increase participation among employees. Practitioners could utilize the platform using Information Communication Technology (ICT) programs and mobile devices to motivate employees to participate in wellness programs and do social engagement and leisure programs.

Limitations and Suggestions for Future Research

There are several limitations in this study. First of all, the study setting includes only employees from the University of Illinois at Urbana-Champaign. With this setting, the results of the study may not be generalizable to other work environments with different populations or different wellness programs. Also, data was collected for only 24 months after participants were randomly assigned to either the treatment or control group. As a result, it may take more than 24 months for significant outcomes (i.e., changes in health behavior and health status, absenteeism, presenteeism) to emerge. Lastly, data collection took place before the COVID-19 pandemic started. The COVID-19 pandemic has led the workplaces to move from office-based work to

remote work situations (Kaushik & Guleria, 2020). Considering the impact of the COVID-19 pandemic on the workplace setting, more research is needed on how workplace wellness programs have adapted their program offerings (i.e., format and delivery of programs), to facilitate continued participation despite changes to work modes (e.g., working from home rather than a campus location).

This study has contributed to how workplace wellness program affects older employees' behavior, health, and perception of wellness programs. However, it is clear that more research is needed to address the possible outcomes of workplace wellness on older employees. The Illinois workplace wellness study findings indicate the overall impact of a workplace wellness program on-campus employee's health but I believe future research should focus more on encouraging older workers to participate more in workplace wellness programs because they have higher rates of chronic disease than younger workers and they have a disproportionate impact on the healthcare system.

Also, as we have mentioned above, the COVID-19 pandemic issue has changed people's work environments and lives significantly. Thus, the way workplace wellness programs are implemented may also change. For example, employers should provide workplace wellness programs that are adjustable in work-at-home settings. Workplace wellness programs using Information Communication Technology (ICT) programs can be the way to reduce barriers to participation. Because ICT programs are asynchronous, employees can participate in the programs at their most convenient time and any place. Also, ICT programs enable workers to engage in wellness activities with other employees without physically meeting with them (Thulin & Vilhelmson, 2006). Incorporating more ICT programs into workplace wellness initiatives may improve participation since there is evidence of the positive effects these programs have on older

adult's health and perceptions on health behaviors (Cook et al., 2015; Irvine et al., 2013; Rozman & Širok, 2020; Stara et al., 2020).

Conclusion

This study provides insight into outcomes associated with participation in a typical workplace wellness program among older employees. This study was focused on examining how age, health behavior, wellness program participation rate, level of job satisfaction, absenteeism and presenteeism, presence or absence of chronic disease that affected older participants' experience in the workplace wellness program. Findings of this study showed that the older employee group was more engaging in health behaviors compared to the young employee group. However, we could not significantly relate variables such as workplace behavior, wellness participation rate, and chronic disease with workplace wellness programs among older employees. Future research should focus more on actual participation in workplace wellness programs among older adults and analyze the practical values and barriers of the workplace wellness program.

REFERENCES

- Aday, R. H., & Kehoe, G. (2008). Working in old age: benefits of participation in the senior community service employment program. *Journal of Workplace Behavioral Health*, 23(1-2), 125-145.
- Ages, R. Today's Research on Aging. (April 2018) Program and policy implications. No. 37
- Ahola, K., Honkonen, T., Virtanen, M., Aromaa, A., & Lönnqvist, J. (2008). Burnout in relation to age in the adult working population. *Journal of occupational health*, 0806030017-0806030017.
- Aldana, S. G., Merrill, R. M., Price, K., Hardy, A., & Hager, R. (2005). Financial impact of a comprehensive multisite workplace health promotion program. *Preventive medicine*, 40(2), 131-137.
- Allen, T. D., & Shockley, K. M. (2012). Older workers and work-family issues. *The Oxford handbook of work and aging*, 520-537.
- Ammendolia, C., Côté, P., Cancelliere, C., Cassidy, J. D., Hartvigsen, J., Boyle, E., ... & Amick, B. (2016). Healthy and productive workers: using intervention mapping to design a workplace health promotion and wellness program to improve presenteeism. *BMC Public Health*, 16(1), 1-18.
- Baicker, K., Cutler, D., & Song, Z. (2010). Workplace wellness programs can generate savings. *Health affairs*, 29(2), 304-311.
- Bandura, A. (2010). Self-efficacy. *The Corsini encyclopedia of psychology*, 1-3.
- Bertera, R. L. (1990). The effects of workplace health promotion on absenteeism and employment costs in a large industrial population. *American journal of public health*, 80(9), 1101-1105.

- Brown, C. A. (2015). Successful aging. *The Encyclopedia of Adulthood and Aging*, 1-5.
- Brown, H. E., Gilson, N. D., Burton, N. W., & Brown, W. J. (2011). Does physical activity impact on presenteeism and other indicators of workplace well-being?. *Sports Medicine*, 41(3), 249-262.
- Brown, J. S., & McCreedy, M. (1986). The hale elderly: Health behavior and its correlates. *Research in Nursing & Health*, 9(4), 317-329.
- Buber, I., Prskawetz, A., Engelhardt, H., Schwarz, F., & Winter-Ebmer, R. (2006). Survey of Health, Ageing and Retirement in Europe. SHARE. First Results for Austria. *Forschungsbericht*, 31.
- Bui, T. T. M., Button, P., & Picciotti, E. G. (2020). Early Evidence on the Impact of Coronavirus Disease 2019 (COVID-19) and the Recession on Older Workers. *Public Policy & Aging Report*, 30(4), 154-159.
- Bureau of Labor Statistics. (2020). The employment situation – April 2020 .
- Callaghan, D. (2005). Healthy behaviors, self-efficacy, self-care, and basic conditioning factors in older adults. *Journal of community health nursing*, 22(3), 169-178.
- Cancelliere, C., Cassidy, J. D., Ammendolia, C., & Côté, P. (2011). Are workplace health promotion programs effective at improving presenteeism in workers? A systematic review and best evidence synthesis of the literature. *BMC public health*, 11(1), 1-11.
- Caverley, N., Cunningham, J. B., & MacGregor, J. N. (2007). Sickness presenteeism, sickness absenteeism, and health following restructuring in a public service organization. *Journal of Management Studies*, 44(2), 304-319.

- CDC COVID-19 Response Team, CDC COVID-19 Response Team, CDC COVID-19 Response Team, Bialek, S., Boundy, E., Bowen, V., ... & Sauber-Schatz, E. (2020). Severe outcomes among patients with coronavirus disease 2019 (COVID-19)—United States, February 12–March 16, 2020. *Morbidity and mortality weekly report*, 69(12), 343-346.
- Champion, V. L., & Skinner, C. S. (2008). The health belief model. *Health behavior and health education: Theory, research, and practice*, 4, 45-65.
- Chen, M. M., Tsai, A. C., & Wang, J. Y. (2016). The effectiveness and barriers of implementing a workplace health promotion program to improve metabolic disorders in older workers in Taiwan. *Global health promotion*, 23(2), 6-14.
- Cho, E., & Chen, T. Y. (2020). The bidirectional relationships between effort-reward imbalance and sleep problems among older workers. *Sleep Health*.
- Choi, C., & Bum, C. H. (2019). Physical leisure activity and work for quality of life in the elderly. *Journal of Physical Education and Sport*, 19(2), 1230-1235.
- Chou, R. J. A., & Choi, N. G. (2011). Prevalence and correlates of perceived workplace discrimination among older workers in the United States of America. *Ageing and Society*, 31(6), 1051.
- Claxton, G., Rae, M., Panchal, N., Whitmore, H., Damico, A., Kenward, K., & Long, M. (2015). Health benefits in 2015: stable trends in the employer market. *Health Affairs*, 34(10), 1779-1788.
- Cook, R. F., Hersch, R. K., Schlossberg, D., & Leaf, S. L. (2015). A Web-based health promotion program for older workers: randomized controlled trial. *Journal of medical Internet*

research, 17(3), e82.

Cornwell, E. Y., & Waite, L. J. (2009). Social disconnectedness, perceived isolation, and health among older adults. *Journal of health and social behavior*, 50(1), 31-48.

Crawford, J. O., Graveling, R. A., Cowie, H. A., & Dixon, K. (2010). The health safety and health promotion needs of older workers. *Occupational Medicine*, 60(3), 184-192.

Dailey, S. L., Burke, T. J., & Carberry, E. G. (2018). For better or for work: Dual discourses in a workplace wellness program. *Management Communication Quarterly*, 32(4), 612-626.

Dave, D., Rashad, I., & Spasojevic, J. (2006). The effects of retirement on physical and mental health outcomes (No. w12123). National Bureau of Economic Research.

Dew, K., Keefe, V., & Small, K. (2005). 'Choosing' to work when sick: workplace presenteeism. *Social science & medicine*, 60(10), 2273-2282.

Duerden, M. D., Courtright, S. H., & Widmer, M. A. (2018). Why people play at work: A theoretical examination of leisure-at-work. *Leisure Sciences*, 40(6), 634-648.

Eime, R. M., Harvey, J. T., Charity, M. J., & Payne, W. R. (2016). Population levels of sport participation: implications for sport policy. *BMC public health*, 16(1), 1-8.

Farrow, A., & Reynolds, F. (2012). Health and safety of the older worker. *Occupational Medicine*, 62(1), 4-11.

Feinsod, R. R., & Davenport, T. O. (2006). The aging workforce: Challenge or opportunity?. *The Journal of Total Rewards*, 15(3), 14.

Fleming, L. E., Lee, D. J., Martinez, A. J. C., LeBlanc, W. G., McCollister, K. E., Bridges, K. C., ... & Pitman, T. (2007). The health behaviors of the older US worker. *American journal of*

industrial medicine, 50(6), 427-437.

Ghilarducci, T., & Farmand, A. (2020). Older Workers on the COVID-19-Frontlines without Paid Sick Leave. *Journal of Aging & Social Policy*, 1-6.

Gillespie, C. W. I., & Louw, J. (1993). Life satisfaction in old age and activity theory: should the debate be re-opened. *Southern African Journal of Gerontology*, 2(1), 25-30.

Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2008). *Health behavior and health education: theory, research, and practice*. John Wiley & Sons.

Goetzel, R. Z., Long, S. R., Ozminkowski, R. J., Hawkins, K., Wang, S., & Lynch, W. (2004). Health, absence, disability, and presenteeism cost estimates of certain physical and mental health conditions affecting US employers. *Journal of occupational and environmental medicine*, 46(4), 398-412.

Gosselin, E., Lemyre, L., & Corneil, W. (2013). Presenteeism and absenteeism: Differentiated understanding of related phenomena. *Journal of occupational health psychology*, 18(1), 75.

Gristwood, J. (2011). Applying the health belief model to physical activity engagement among older adults. *Illuminare*, 9.

Hannon, K. (2019, July 21). 10 Reasons To Hire and Retain Workers 50+. Retrieved December 17, 2020, from <https://www.forbes.com/sites/kerryhannon/2019/07/21/10-reasons-to-hire-and-retain-workers-50/?sh=741959e52faa>

Hao, Y. (2008). Productive activities and psychological well-being among older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 63(2),

S64-S72.

Harrison, D. A., & Price, K. H. (2003). Context and consistency in absenteeism: Studying social and dispositional influences across multiple settings. *Human Resource Management Review*, 13(2), 203-225.

Hartman, K. A. (2002). Health belief model and it's application to mammography screening in a K-12 school district employee wellness program (Doctoral dissertation, Montana State University-Bozeman, College of Education, Health & Human Development).

Havighurst, R. J. (1963). Successful aging. *Processes of aging: Social and psychological perspectives*, 1, 299-320.

Henkens, K., & Leenders, M. (2010). Burnout and older workers' intentions to retire. *International Journal of Manpower*, 31(3), 306-321.

Hewitt, A. (2015). A business case for workers age 50+: A look at the value of experience. A report prepared for the American Association of Retired People (AARP).

Hildt-Ciupińska, K., & Bugajska, J. (2013). Evaluation of activities and needs of older workers in the context of maintaining their employment. *Medycyna Pracy*, 64(3), 297-306.

Hochbaum, G., Rosenstock, I., & Kegels, S. (1952). Health belief model. *United states public health service*, 1.

Hong, S., Jeong, H., Heo, Y., Chun, H., Park, J., & Kim, D. (2015). Factors associated with health-related quality of life in Korean older workers. *Annals of occupational and environmental medicine*, 27(1), 25.

Hoonakker, P., & van Duivenbooden, C. (2010). Monitoring working conditions and health of

- older workers in Dutch construction industry. *American journal of industrial medicine*, 53(6), 641-653.
- Hughes, S. L., Seymour, R. B., Campbell, R. T., Shaw, J. W., Fabiyi, C., & Sokas, R. (2011). Comparison of two health-promotion programs for older workers. *American journal of public health*, 101(5), 883-890.
- Hyatt Neville, B., Merrill, R. M., & Kumpfer, K. L. (2011). Longitudinal outcomes of a comprehensive, incentivized worksite wellness program. *Evaluation & the health professions*, 34(1), 103-123.
- Irvine, A. B., Gelatt, V. A., Seeley, J. R., Macfarlane, P., & Gau, J. M. (2013). Web-based intervention to promote physical activity by sedentary older adults: randomized controlled trial. *Journal of medical Internet research*, 15(2), e19.
- Janssen, S. (2011). Older adult perceptions of physical activity. The University of North Dakota.
- Jaul, E., & Barron, J. (2017). Age-related diseases and clinical and public health implications for the 85 years old and over population. *Frontiers in public health*, 5, 335.
- Johns, G. (2003). How methodological diversity has improved our understanding of absenteeism from work. *Human resource management review*, 13(2), 157-184.
- Jones, M. K., Latreille, P. L., Sloane, P. J., & Staneva, A. V. (2013). Work-related health risks in Europe: Are older workers more vulnerable?. *Social Science & Medicine*, 88, 18-29.
- Kanfer, R., Lyndgaard, S. F., & Tatel, C. E. (2020). For whom the pandemic tolls: a person-centric analysis of older workers. *Work, Aging and Retirement*, 6(4), 238-241.
- Kaushik, M., & Guleria, N. (2020). The impact of pandemic COVID-19 in workplace. *European*

Journal of Business and Management, 12(15), 1-10.

Kenny, G. P., Yardley, J. E., Martineau, L., & Jay, O. (2008). Physical work capacity in older adults: implications for the aging worker. *American journal of industrial medicine*, 51(8), 610-625.

Kim, J. E., & Moen, P. (2002). Retirement transitions, gender, and psychological well-being: A life-course, ecological model. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 57(3), P212-P222.

Koopman, C., Pelletier, K. R., Murray, J. F., Sharda, C. E., Berger, M. L., Turpin, R. S., ... & Bendel, T. (2002). Stanford presenteeism scale: health status and employee productivity. *Journal of occupational and environmental medicine*, 44(1), 14-20.

Ledikwe, J. H., Kleinman, N. J., Mpho, M., Mothibedi, H., Mawandia, S., Semo, B. W., & O'Malley, G. (2018). Associations between healthcare worker participation in workplace wellness activities and job satisfaction, occupational stress and burnout: a cross-sectional study in Botswana. *BMJ open*, 8(3), e018492.

Ledikwe, J. H., Kleinman, N. J., Mpho, M., Mothibedi, H., Mawandia, S., Semo, B. W., & O'Malley, G. (2018). Associations between healthcare worker participation in workplace wellness activities and job satisfaction, occupational stress and burnout: a cross-sectional study in Botswana. *BMJ open*, 8(3), e018492.

Leijten, F. R., de Wind, A., van den Heuvel, S. G., Ybema, J. F., van der Beek, A. J., Robroek, S. J., & Burdorf, A. (2015). The influence of chronic health problems and work-related factors on loss of paid employment among older workers. *J Epidemiol Community Health*, 69(11), 1058-1065.

- Leijten, F. R., van den Heuvel, S. G., van der Beek, A. J., Ybema, J. F., Robroek, S. J., & Burdorf, A. (2015). Associations of work-related factors and work engagement with mental and physical health: a 1-year follow-up study among older workers. *Journal of occupational rehabilitation*, 25(1), 86-95.
- Lemon, B. W., Bengtson, V. L., & Peterson, J. A. (1972). An exploration of the activity theory of aging: Activity types and life satisfaction among in-movers to a retirement community. *Journal of gerontology*, 27(4), 511-523.
- Lindemann, N. (2019). What's the average survey response rate? [2019 benchmark]. 57 <https://surveyanyplace.com/average-survey-response-rate/>
- Linnan, L., Bowling, M., Childress, J., Lindsay, G., Blakey, C., Pronk, S., ... & Royall, P. (2008). Results of the 2004 national worksite health promotion survey. *American Journal of Public Health*, 98(8), 1503-1509.
- Litchfield, P., Cooper, C., Hancock, C., & Watt, P. (2016). *Work and wellbeing in the 21st century*.
- Macdonald, J. L., & Levy, S. R. (2016). Ageism in the workplace: The role of psychosocial factors in predicting job satisfaction, commitment, and engagement. *Journal of Social Issues*, 72(1), 169-190.
- Maestas, N., Mullen, K. J., Powell, D., Von Wachter, T., & Wenger, J. B. (2017). *Working Conditions in the United States Results of the 2015 American Working Conditions Survey*. Santa Monica, CA: RAND Corporation.
- Magnavita, N. (2018). Obstacles and future prospects: considerations on health promotion activities for older Workers in Europe. *International journal of environmental research and*

public health, 15(6), 1096.

Mandal, B., & Roe, B. E. (2007). Job loss, retirement and the mental health of older Americans.

Retirement and the Mental Health of Older Americans (June 2007).

Marchand, A., Blanc, M. E., & Beaugard, N. (2018). Do age and gender contribute to workers' burnout symptoms?. *Occupational Medicine*, 68(6), 405-411.

Mata, R., Josef, A. K., Samanez-Larkin, G. R., & Hertwig, R. (2011). Age differences in risky choice: a meta-analysis. *Annals of the New York Academy of Sciences*, 1235, 18.

Mattke, S., Liu, H., Caloyeras, J., Huang, C. Y., Van Busum, K. R., Khodyakov, D., & Shier, V. (2013). Workplace Wellness Programs Study: Final Report. *Rand health quarterly*, 3(2), 7.

Mattke, S., Schnyer, C., & Van Busum, K. R. (2013). A review of the US workplace wellness market. *Rand health quarterly*, 2(4).

McAuley, E., Mullen, S. P., Szabo, A. N., White, S. M., Wójcicki, T. R., Mailey, E. L., ... & Kramer, A. F. (2011). Self-regulatory processes and exercise adherence in older adults: executive function and self-efficacy effects. *American journal of preventive medicine*, 41(3), 284-290.

Meisner, B. A., Dogra, S., Logan, A. J., Baker, J., & Weir, P. L. (2010). Do or decline? Comparing the effects of physical inactivity on biopsychosocial components of successful aging. *Journal of health psychology*, 15(5), 688-696.

Melzner, J., Heinze, J., & Fritsch, T. (2014). Mobile health applications in workplace health promotion: an integrated conceptual adoption framework. *Procedia Technology*, 16, 1374-1382.

- Merrill, R. M., Aldana, S. G., 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.
- Miller, C. A. (2009). *Nursing for wellness in older adults*. Lippincott Williams & Wilkins.
- Miltiades, H. B., Grove, S. A., & Drenovsky, C. (2005). Understanding the impact of senior community center participation on elders' health and well-being In project report prepared for Commonwealth of Pennsylvania-Department of Aging.
- Mitchell, J. M., & Anderson, K. H. (1989). Mental health and the labor force participation of older workers. *Inquiry*, 262-271.
- Morris, Z. A. (2020). Loneliness as a predictor of work disability onset among nondisabled, working older adults in 14 Countries. *Journal of aging and health*, 32(7-8), 554-563.
- Munnell, A. H., Sanzenbacher, G., Webb, A., & Gillis, C. (2016). Are early claimers making a mistake?. CRR WP, 5.
- Munro, L. (2007). Absenteeism and presenteeism: possible causes and solutions: peer reviewed original article. *South African Radiographer*, 45(1), 21-23.
- National Research Council. (2004). *Health and safety needs of older workers*. National Academies Press.
- Naumanen, P. (2006). The health promotion of aging workers from the perspective of occupational health professionals. *Public Health Nursing*, 23(1), 37-45.
- Neumark, D., & Button, P. (2014). Did age discrimination protections help older workers weather the great recession?. *Journal of Policy Analysis and Management*, 33(3), 566-601.

- Ng, T. W., & Feldman, D. C. (2012). Evaluating six common stereotypes about older workers with meta-analytical data. *Personnel psychology*, 65(4), 821-858.
- Nigg, C. R., Burbank, P. M., Padula, C., Dufresne, R., Rossi, J. S., Velicer, W. F., ... & Prochaska, J. O. (1999). Stages of change across ten health risk behaviors for older adults. *The Gerontologist*, 39(4), 473-482.
- Nimrod, G., & Shrira, A. (2016). The paradox of leisure in later life. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 71(1), 106-111.
- North, M. S., & Fiske, S. T. (2016). Resource scarcity and prescriptive attitudes generate subtle, intergenerational older-worker exclusion. *Journal of Social Issues*, 72(1), 122-145.
- O'Donnell, M. P. (2008). The face of wellness: Aspirational vision of health, renewing health behavior change process and balanced portfolio approach to planning change strategies. *American Journal of Health Promotion*, 23(2), 1-13.
- Oksanen, T., & Virtanen, M. (2012). Health and retirement: a complex relationship. *European Journal of Ageing*, 9(3), 221-225.
- Patacchini, E., & Engelhardt, G. V. (2016). Work, retirement, and social networks at older ages. *CRR WP*, 15.
- Pencak, M. (1991). Workplace health promotion programs. An overview. *The Nursing Clinics of North America*, 26(1), 233-240.
- 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.
- Pino, L., González-Vélez, A. E., Prieto-Flores, M. E., Ayala, A., Fernandez-Mayoralas, G., Rojo-

- Perez, F., ... & Forjaz, M. J. (2014). Self-perceived health and quality of life by activity status in community-dwelling older adults. *Geriatrics & gerontology international*, 14(2), 464-473.
- Pitt-Catsouphes, M., James, J. B., & Matz-Costa, C. (2015). Workplace-based health and wellness programs: the intersection of aging, work, and health. *The Gerontologist*, 55(2), 262-270.
- Poscia, A., Moscato, U., La Milia, D. I., Milovanovic, S., Stojanovic, J., Borghini, A., ... & Magnavita, N. (2016). Workplace health promotion for older workers: a systematic literature review. *BMC health services research*, 16(5), 329.
- Pronk, N. P. (2014). Placing workplace wellness in proper context: value beyond money. *Preventing chronic disease*, 11.
- Reardon, J. (1998). The history and impact of worksite wellness. *Nursing Economics*, 16(3), 117.
- Reif, J., Chan, D., Jones, D., Payne, L., & Molitor, D. (2020). Effects of a workplace wellness program on employee health, health beliefs, and medical use: A randomized clinical trial. *JAMA internal medicine*, 180(7), 952-960.
- Rosenstock, I. M. (1974). The health belief model and preventive health behavior. *Health education monographs*, 2(4), 354-386.
- Rožman, M., Treven, S., Čančer, V., & Cingula, M. (2017). Burnout of older and younger employees—the case of Slovenia. *Organizacija*, 50(1), 47-62.
- Rozman, N., & Širok, K. (2020). E-platform as an innovative approach to workplace health promotion for ageing workforce. *European Journal of Public Health*, 30(Supplement_5), ckaa166-451.

- Saghafi-Asl, M., Aliasgharzadeh, S., & Asghari-Jafarabadi, M. (2020). Factors influencing weight management behavior among college students: An application of the Health Belief Model. *PloS one*, 15(2), e0228058.
- Schmidt, K., & Pförtner, T. K. (2020). Job Insecurity, Sickness Presenteeism and the Moderating Effect of Workplace Health Promotion. *Journal of Occupational and Environmental Medicine*, 62(11), 937-942.
- Schwatka, N. V., Smith, D., Weitzenkamp, D., Atherly, A., Dally, M. J., Brockbank, C. V., ... & Newman, L. S. (2018). The impact of worksite wellness programs by size of business: a 3-year longitudinal study of participation, health benefits, absenteeism, and presenteeism. *Annals of work exposures and health*, 62(Supplement_1), S42-S54.
- Segel-Karpas, D., Ayalon, L., & Lachman, M. E. (2018). Loneliness and depressive symptoms: The moderating role of the transition into retirement. *Aging & mental health*, 22(1), 135-140.
- Shankar, A., McMunn, A., & Steptoe, A. (2010). Health-related behaviors in older adults: relationships with socioeconomic status. *American journal of preventive medicine*, 38(1), 39-46.
- Shephard, R. J. (2000). Worksite health promotion and the older worker. *International Journal of Industrial Ergonomics*, 25(5), 465-475.
- Sloane-Seale, A., & Kops, B. (2008). Older adults in lifelong learning: Participation and successful aging. *Canadian Journal of University Continuing Education*, 34(1).
- Stara, V., Santini, S., Kropf, J., & D'Amen, B. (2020). Digital health coaching programs among

- older employees in transition to retirement: Systematic literature review. *Journal of medical Internet research*, 22(9), e17809.
- Statistics, B. O. L. (2016). *Census of fatal occupational injuries*. Washington, DC: Bureau of Labor Statistics.
- Steffen, M. W., Hazelton, A. C., Moore, W. R., Jenkins, S. M., Clark, M. M., & Hagen, P. T. (2015). Improving sleep: outcomes from a worksite healthy sleep program. *Journal of occupational and environmental medicine*, 57(1), 1-5.
- Steinkamp, M. W., & Kelly, J. R. (1987). Social integration, leisure activity, and life satisfaction in older adults: Activity theory revisited. *The International Journal of Aging and Human Development*, 25(4), 293-307.
- Thomson, E. R & Phua, FT T (2012). A Brief Index of Affective Job satisfaction, *Organisation Management*, 37(3), 275-307.
- Thulin, E., & Vilhelmson, B. (2006). Virtual mobility and processes of displacement: Young people's changing use of ICT, time, and place. *NETCOM: Réseaux, communication et territoires/Networks and communication studies*, 20(1), 27-40.
- Tkatch, R., Musich, S., MacLeod, S., Kraemer, S., Hawkins, K., Wicker, E. R., & Armstrong, D. G. (2017). A qualitative study to examine older adults' perceptions of health: Keys to aging successfully. *Geriatric Nursing*, 38(6), 485-490.
- Tringali, V., & Aldridge, C. (2021). Physical Activity Climate and Health Beliefs Are Associated with Workplace Physical Activity Program Participation of Older Employees of a Public University. *Physical Activity and Health*, 5(1).

- Truxillo, D. M., Cadiz, D. M., & Hammer, L. B. (2015). Supporting the aging workforce: A review and recommendations for workplace intervention research.
- U.S. Bureau of Labor Statistics. (2019). Survey of occupational injuries and illnesses.
- United Nations. (2019). World population ageing 2019: highlights. World population ageing.
- US Department of Health and Human Services. (2019). Administration on aging. 2017 Profile of older Americans.
- USBoL, S. (2020). Employment status of the civilian noninstitutional population by age, sex, and race. Labor Force Statistics from the Current Population Survey.
- Van Wissen, A., Vinkers, C., & van Halteren, A. (2016, April). Developing a virtual coach for chronic patients: A user study on the impact of similarity, familiarity and realism. In International conference on persuasive technology (pp. 263-275). Springer, Cham.
- Warehime, S., Coyle, B., Abel, K., Sedani, A., Holes, J., & Dinkel, D. (2019). A Qualitative Exploration of a Worksite Wellness Mini-Grant Program. *Environmental health insights*, 13, 1178630219839016.
- Weber, J., Angerer, P., & Müller, A. (2019). Individual consequences of age stereotypes on older workers. *Zeitschrift für Gerontologie und Geriatrie*, 1-18.
- Wegman, D. H., & McGee, J. P. (2004). Health and safety needs of older workers.
- White, M. S., Burns, C., & Conlon, H. A. (2018). The impact of an aging population in the workplace. *Workplace health & safety*, 66(10), 493-498.
- Williams, H. L., Costley, T., Bellury, L. M., & Moobed, J. (2018). Do Health Promotion Behaviors Affect Levels of Job Satisfaction and Job Stress for Nurses in an Acute Care Hospital?.

- JONA: The Journal of Nursing Administration, 48(6), 342-348.
- Winstead, V., Yost, E. A., Cotten, S. R., Berkowsky, R. W., & Anderson, W. A. (2014). The impact of activity interventions on the well-being of older adults in continuing care communities. *Journal of Applied Gerontology*, 33(7), 888-911.
- Wolf, M. S., Gazmararian, J. A., & Baker, D. W. (2007). Health literacy and health risk behaviors among older adults. *American journal of preventive medicine*, 32(1), 19-24.
- Woods, R. A. Sports and exercise. Bureau of Labor Statistics. 2017.
- Wolf, S. H., & Schoemaker, H. (2019). Life expectancy and mortality rates in the United States, 1959-2017. *Jama*, 322(20), 1996-2016. Centers for Disease Control and Prevention. (2017). *Health, United States, 2016: With chartbook on long-term trends in health*. Hyattsville, MD: National Center for Health Statistics.
- World Health Organization. (1998). *Health promotion glossary*. World Health Organization.
- Zaniboni, S. (2015). The interaction between older workers' personal resources and perceived age discrimination affects the desired retirement age and the expected adjustment. *Work, Aging and Retirement*, 1(3), 266-273.
- Zanjani, F. A., Schaie, W. K., & Willis, S. L. (2006). Age group and health status effects on health behavior change. *Behavioral Medicine*, 32(2), 36-46.

APPENDIX A: IRB APPROVAL LETTER

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects
528 East Green Street
Suite 203
Champaign, IL 61820



March 14, 2016

Julian Reif
Department of Finance
340 Wohlers Hall
1206 South Sixth Street
Champaign, IL 61820

RE: *Worksite wellness: A field experiment on participation incentives and selection into wellness programs*
IRB Protocol Number: 16456

Dear Dr. Reif:

Your response to required modifications for the project entitled *Worksite wellness: A field experiment on participation incentives and selection into wellness programs* has satisfactorily addressed the concerns of the University of Illinois at Urbana-Champaign Institutional Review Board (IRB) and you are now free to proceed with the human subjects protocol. The UIUC IRB approved the protocol as described in your IRB-1 application with stipulated changes, as part of their monthly review. Certification of approval is available upon request. The expiration date for this protocol, IRB number 16456, is 03/09/2017. The risk designation applied to your project is *no more than minimal risk*.

Copies of the attached date-stamped consent form(s) must be used in obtaining informed consent. If there is a need to revise or alter the consent form(s), please submit the revised form(s) for IRB review, approval, and date-stamping prior to use.

Under applicable regulations, no changes to procedures involving human subjects may be made without prior IRB review and approval. The regulations also require that you promptly notify the IRB of any problems involving human subjects, including unanticipated side effects, adverse reactions, and any injuries or complications that arise during the project.

If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at the OPRS office, or visit our Web site at <http://oprs.research.illinois.edu>.

Sincerely,

Ron Banks, MS, CIP
Human Subjects Research Coordinator, Office for the Protection of Research Subjects

Attachment(s): Written informed consent documents; online informed consent documents; and Waiver of Documentation of Informed Consent form

c: Laura Payne
David Molitor
Damon Jones