Proceedings of the International Conference on Global Politics and Socio-Humanities
DOI: 10.54254/2753-7064/13/20230345

Design Strategies for Office Micro-Fitness Behavior under the Health Belief Model

Xiangquan Zhang[1,a], and Xiang Chen[1,b,*]

[1]Hangzhou University of Electronic Science and Technology, School of Humanities, Arts, and Digital Media, No. 1158, No.2 Street, Baiyang Street, Qiantang District, Hangzhou, Zhejiang, China

a. zhangxq310@hdu.edu.cn, b. cx1097899610@163.com

**corresponding author*

Abstract: Prolonged sedentary behavior in office settings has become a common trigger for health problems in modern life. This paper, based on the Health Belief Model, aims to provide design strategies for micro-fitness behaviors among office populations. By fostering awareness of health issues, emphasizing the benefits of micro-fitness, enhancing self-efficacy, reducing the cost of micro-fitness, and offering motivation and support, office workers can incorporate simple and feasible micro-fitness activities into their daily work routines. This, in turn, can improve physical activity levels and mitigate the health problems associated with prolonged sitting. This research provides a theoretical foundation and practical guidance for the design of office micro-fitness, offering valuable insights into promoting employee health and productivity. However, further optimization and refinement of strategies are needed to enhance employee engagement and the sustainability of these strategies, in order to achieve more ideal outcomes.

Keywords: sedentary behavior, health belief, office micro-fitness, design strategies

1. Introduction

In the fast-paced office environment, many individuals inevitably spend prolonged hours seated at their desks, leading to a growing prevalence of health issues associated with sedentary behavior [1]. Due to changes in modern lifestyles and work environments, people increasingly rely on electronic devices for entertainment, such as computers and smartphones, which result in extended periods of desk work. Furthermore, the use of transportation modes like cars and electric scooters has increased sedentary time, causing individuals to remain in static positions for extended periods, lacking sufficient physical activity. Additionally, with the rapid advancement of information technology, office work has gradually shifted from traditional physical spaces to computer-centric office settings. Office personnel often find themselves seated for extended durations, engaging in computer-related tasks, document processing, and meetings. This prolonged sitting behavior has become commonplace in modern workplaces [2-4].

To address this situation, this paper will apply the Health Belief Model to provide design strategies for micro-fitness behaviors tailored to the sedentary office population, aiming to encourage physical activity in their daily work routines and promote overall physical health [5].

DOI: 10.54254/2753-7064/13/20230345

2. Office Sedentary Behavior and Its Health Implications

2.1. Classification of Sedentary Behavior Populations

Due to work, study, or lifestyle requirements, certain populations often spend prolonged periods in a seated position. These sedentary behaviors are categorized into work-related and lifestyle-related, such as:

Work-related categories:

Office workers who spend extended hours seated at their desks to complete tasks, including clerical staff, administrative personnel, and computer engineers.

Programmers, web designers, and social media managers who frequently use electronic devices like computers, tablets, smartphones.

Long-distance transportation workers, such as drivers, long-haul bus drivers, and pilots, who remain seated in vehicles or cockpits due to the nature of their work.

Lifestyle-related categories:

Students, who may sit for extended periods while attending classes, doing homework, or preparing for exams.

Elderly individuals, some of whom, due to physical conditions or other factors, are more prone to prolonged sitting, especially those with limited mobility or monotonous daily routines.

Homemakers and househusbands, who may spend extended periods sitting while attending to household chores.

Leisure activities such as television viewers and video game players, who commonly engage in prolonged sitting during entertainment activities.

In these population groups, prolonged sitting habits are prevalent due to work, study, or lifestyle needs. Therefore, it is crucial for them to be mindful of the potential health risks associated with sedentary behavior and take proactive measures to reduce their sitting time [6].

2.2. Characteristics of Office Sedentary Behavior

Office sedentary behavior, as a modern lifestyle, exhibits distinctive features, including:

Prolonged periods of sitting: Office workers typically spend extended hours at their desks with minimal physical activity.

Lack of exercise: Due to the nature of their work, office personnel often struggle to find time for physical exercise or aerobic activities.

Repetitive movements: Office tasks often involve repetitive actions such as keyboard typing and mouse usage, leading to sustained strain on certain body parts.

Environmental constraints: Office environments are often enclosed, with limited space for physical activity, restricting employees' opportunities for exercise [7].

2.3. The Impact of Prolonged Sitting on Physical and Mental Health

Office sedentary behavior has broad and far-reaching effects on physical health, encompassing various health issues, primarily including:

Musculoskeletal problems: Prolonged sitting can lead to discomfort and pain, particularly in the neck, shoulders, lower back, and legs.

Cardiovascular diseases: The relationship between sedentary behavior and conditions like high blood pressure, heart disease, and stroke is well-documented.

Obesity: Sedentary behavior contributes to weight gain and obesity by reducing metabolism and energy expenditure.

Metabolic disturbances: Prolonged sitting can disrupt metabolic balance, leading to unstable

DOI: 10.54254/2753-7064/13/20230345

blood sugar levels and an increased risk of diabetes, among other issues.

However, the impact of office sedentary behavior extends beyond physical health and extends into the realm of mental well-being. In terms of mental health, prolonged sitting can result in various adverse effects, including:

Physical fatigue and low mood, increasing the likelihood of emotional issues such as anxiety and depression.

Elevated work-related and psychological stress due to extended periods of screen time and demanding tasks.

Social isolation and loneliness, as the closed-off office environment can lead to feelings of disconnection and further affect mental health.

In summary, office sedentary behavior not only poses a multitude of physical health challenges but also presents a series of significant implications for mental health. The complexity of these health issues necessitates the exploration of effective intervention strategies to mitigate the adverse effects of prolonged sitting on overall employee health [8-11].

3. Introduction to Micro-Fitness Behavior

3.1. Concept and Characteristics of Micro-Fitness Behavior

Micro-fitness behavior refers to health-promoting activities that involve simple and easily implementable exercises or movements, designed to break up prolonged periods of sitting and increase physical activity. As an emerging concept in health promotion, micro-fitness emphasizes the integration of light physical activities into daily life to mitigate the health risks associated with prolonged sitting.

Key characteristics of micro-fitness behavior can be summarized as follows:

Simplicity and ease of implementation: Micro-fitness behaviors typically do not require additional equipment or specific facilities. Employees can engage in them at locations such as their desks, meeting rooms, or office building stairs.

Flexibility in timing: Micro-fitness activities can be spread across multiple time slots within the workday, requiring minimal time investment, making them adaptable to busy work schedules.

Low intensity: Micro-fitness activities typically involve low-intensity movements such as stretching, toe-tapping, or walking, avoiding excessive physical fatigue [12].

3.2. Health Benefits of Micro-Fitness Behavior

Micro-fitness behavior, as an intervention strategy aimed at addressing the health issues arising from prolonged sitting among office workers, offers significant benefits for both physical and mental health. Firstly, by promoting blood circulation, micro-fitness effectively reduces numbness and fatigue in the limbs associated with prolonged sitting, enhancing overall comfort. Secondly, the muscle tension-relieving effects of this behavior help alleviate muscle stiffness and discomfort caused by prolonged sitting, particularly in areas such as the neck, shoulders, and lower back. Additionally, although micro-fitness behavior is relatively low in intensity, its frequent implementation can increase energy expenditure, supporting weight management and obesity prevention. Moreover, micro-fitness activities provide brief breaks in the office environment, aiding in stress relief and improving mental well-being. Lastly, moderate micro-fitness behavior enhances employee focus and work efficiency while reducing fatigue and distractions. Thus, micro-fitness behavior, with its comprehensive physical and psychological benefits, offers a practical and effective means of addressing issues related to prolonged sitting.

DOI: 10.54254/2753-7064/13/20230345

3.3. Application of Micro-Fitness Behavior in the Office Environment

Office micro-fitness, as a health strategy to combat sedentary behavior, encompasses various approaches to mitigate its potential hazards. Among these approaches:

Stretching exercises, involving limb stretching at one's workstation, hold promise in relieving muscle fatigue and stiffness.

Sit-stand desks, which allow employees to alternate between sitting and standing while working, effectively reduce prolonged sitting, alleviate lumbar pressure, and improve blood circulation.

Mini exercise equipment such as resistance bands and small dumbbells offer options for in-office workouts, enhancing muscular strength.

On the other hand, activities like walking and taking the stairs instead of using elevators, while limited during work hours, have the potential to increase step count and improve cardiovascular health.

When formulating appropriate fitness strategies, it is essential to consider the workplace environment and individual needs to fully harness their potential benefits.

4. Introduction to the Health Belief Model

The Health Belief Model (HBM) is a classic health behavior theory aimed at explaining the cognitive and attitudinal factors that influence individuals' health-related decisions and behaviors. This model comprises four key elements: perceived health threat, perceived health benefits, perceived barriers, and self-efficacy. It has been widely used in the fields of health promotion and disease prevention. In the office environment, applying the Health Belief Model to guide the design of micro-fitness behavior strategies and providing employees with scientifically sound health behavior guidance offers a promising avenue for mitigating health issues associated with prolonged sitting.

4.1. Origins and Development of the Health Belief Model

The Health Belief Model (HBM) was initially proposed by Hochbaum in 1958 to study the relationship between individuals' health behaviors and their health beliefs. Subsequently, it was revised and refined by social psychologists, including Becker, becoming the classic health behavior theory known today. The HBM is used to explain individuals' cognitions and attitudes in health-related decision-making and behaviors. It has been widely applied in various health interventions and educational activities, facilitating a deeper understanding and prediction of individual health behavior decisions and enabling the development of more precise and effective health promotion strategies.

4.2. Key Components of the Health Belief Model

The interactive elements of the Health Belief Model collectively influence individuals' choices and implementation of health behaviors, providing valuable theoretical foundations for health interventions and promotion. This model consists of the following four essential elements:

Perceived health threat: Refers to an individual's perception of the possibility of experiencing specific health issues.

Perceived health benefits: Reflects an individual's subjective understanding of the benefits of adopting a particular health behavior.

Perceived barriers: Signifies an individual's awareness of the difficulties and obstacles they may encounter when implementing a health behavior.

Self-efficacy: Represents an individual's confidence and belief in their ability to perform a

DOI: 10.54254/2753-7064/13/20230345

specific health behavior.

The Health Belief Model, by analyzing the interactions between these elements, reveals the psychological processes that individuals consider when making decisions and adopting health behaviors. According to this model, individuals are more likely to engage in positive health behaviors when they perceive a health threat, believe that a specific health behavior will yield significant benefits, perceive low barriers to implementation, and possess high self-efficacy. Therefore, when individuals in sedentary populations understand the risks associated with prolonged sitting, recognize the effectiveness of simple and feasible micro-fitness behaviors in improving physical activity levels, and realize that these behaviors do not require significant costs, they are more likely to have the confidence to actively adopt micro-fitness behaviors [13].

5. Micro-Fitness Design Strategies Within the Health Belief Model

Prolonged sitting has become a prominent issue in modern office and daily life, giving rise to various health risks. While micro-fitness is gaining attention as a way to alleviate this issue, its existing approaches' singularity and limitations constrain its effectiveness. By drawing inspiration from the Health Belief Model, we can design micro-fitness strategies from both internal and external factors.

When individuals become aware of health threats and benefits, they are motivated to focus on health and enhance motivation by increasing internal and external self-awareness. Simultaneously, from an external perspective, personalized strategies and well-designed micro-fitness equipment can more precisely meet the needs of employees. Therefore, based on the Health Belief Model, we can design innovative micro-fitness behaviors from both self and external environmental dimensions, which will help mitigate the harm caused by prolonged sitting [14].

5.1. Self-Dimension

Perception of health threat and perception of health benefits are prerequisites for individuals in sedentary populations. Providing health education and promotion is the first step in office micro-fitness strategies. It aims to make employees fully aware of the health threats associated with prolonged sitting and the benefits of micro-fitness behaviors. Specific measures can include disseminating health promotional information within the company through internal communication channels, public areas, or the company website. This information can encompass the impact of prolonged sitting on physical and mental health, raising employee awareness of sedentary behavior. Furthermore, emphasizing the benefits of micro-fitness behaviors for physical and mental health, such as improving blood circulation, relieving muscle tension, and enhancing work efficiency, can increase employee interest and willingness to participate.

More importantly, perceived barriers and self-efficacy require employees to tailor micro-fitness plans, independently allocate micro-fitness time, incorporate micro-fitness into their daily routines amid busy work schedules, and establish habits, such as standing up and moving for a certain period each day or taking short breaks and moving around every hour. Ensuring that the goals are measurable is crucial. At this stage, we can also introduce health mentors or support groups to build self-efficacy through sharing experiences and achievements in micro-fitness or use social media to foster positive micro-fitness beliefs, thereby enhancing adherence.

5.2. External Environmental Dimension

Creating a supportive health environment is a crucial part of office micro-fitness strategies, aiming to provide employees with a conducive micro-fitness environment and encourage their active participation in micro-fitness behaviors. This requires the placement of convenient micro-fitness

DOI: 10.54254/2753-7064/13/20230345

facilities in the office, such as relaxation areas, standing workstations, and walking corridors, enabling employees to engage in micro-fitness during work breaks. Human-centered office design, including adjustable desks, helps incorporate standing into the work environment. Meanwhile, providing leisure areas and a small fitness corner with lightweight exercise equipment like resistance bands and small dumbbells encourages employees to engage in simple strength exercises during breaks and short periods.

Offering ongoing support and feedback is a critical part of office micro-fitness strategies, aiming to motivate employees to sustain micro-fitness behaviors and enhance self-efficacy. This requires regular feedback and monitoring of micro-fitness behaviors, such as introducing timed micro-fitness reminders and periodically notifying employees to engage in light activity. By using reminders with specific intervals, content, and frequencies aligned with the Health Belief Model, motivational triggers can be employed to track micro-fitness behavior and goal achievement, helping employees understand their progress. Additionally, introducing a micro-fitness rewards system can provide incentives and rewards to employees actively participating in micro-fitness behaviors, enhancing their motivation.

Through the above-designed office micro-fitness strategies, employees will find it easier to accept and implement micro-fitness behaviors effectively, alleviating health issues associated with prolonged sitting, improving their physical and mental health, enhancing departmental cohesion, increasing work efficiency, and overall well-being [15].

6. Conclusion

The Health Belief Model has played a pivotal guiding role in the design of office micro-fitness strategies. Through this model, sedentary individuals can gain a deeper understanding of the threats posed by prolonged sitting to both their physical and mental health, as well as the benefits of micro-fitness behaviors for their well-being. Perceiving health threats has awakened employees' health consciousness, making them aware of the adverse consequences that prolonged sitting behavior may bring, thus increasing their willingness to take proactive measures to improve their health. Simultaneously, perceiving health benefits has sparked strong interest among employees in micro-fitness behaviors, as they recognize the positive impact of micro-fitness on their physical and mental health, thereby increasing their willingness and behavioral inclination to engage in micro-fitness activities. Furthermore, recognizing barriers has given employees a clear understanding of the obstacles to implementing micro-fitness behaviors in the office environment. By improving the environment and providing support, these barriers can be overcome, making it easier for employees to participate in micro-fitness activities. Finally, the enhancement of self-efficacy has boosted employees' confidence and self-assurance in implementing micro-fitness behaviors, facilitating their persistence and ongoing engagement in micro-fitness activities.

In exploring the design of office micro-fitness strategies, this paper still has certain limitations and shortcomings. Future research should place greater emphasis on data collection and evaluation to enhance the reliability and scientific rigor of studies. Simultaneously, attention should be directed towards employee motivation, continuously refining and optimizing office micro-fitness strategies to better promote employee physical and mental health and work efficiency.

References

[1] *Duan, L., Yang, H., Zhang, Y., et al. (2013). A review of the subhealth status and fitness methods of office workers. Sichuan Sports Science, 32(01), 43-46.*

[2] *Sun, X., & Xu, B. (2017). Research on office furniture design based on the concept of health. Furniture and Interior Decoration, 2017(11), 24-25.*

DOI: 10.54254/2753-7064/13/20230345

[3] *Zhang, J., & Shen, L. (2023). Analysis of sedentary office behavior and intervention methods. Furniture, 44(01), 65-68+89.*
[4] *Bull, F. C., Al-Ansari, S. S., Biddle, S., et al. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. British Journal of Sports Medicine, 54(24), 1451-1462.*
[5] *Pan, X. F., Wang, L., & Pan, A. (2021). Epidemiology and determinants of obesity in China. The Lancet Diabetes & Endocrinology, 9(6), 373-392.*
[6] *Warburton, D. E. R., Bredin, S. S. D. (2017). Health benefits of physical activity: a systematic review of current systematic reviews. Current Opinion in Cardiology, 32(5), 541-556.*
[7] *Jebeile, H., Kelly, A. S., O'Malley, G., et al. (2022). Obesity in children and adolescents: epidemiology, causes, assessment, and management. The Lancet Diabetes & Endocrinology, 10(5), 351-365.*
[8] *Booth, F. W., Roberts, C. K., & Laye, M. J. (2012). Lack of exercise is a major cause of chronic diseases. Comprehensive Physiology, 2(2), 1143-1211.*
[9] *Mohammad, T., Samadi, et al. (2019). Sedentary Behavior, Exercise, and Cardiovascular Health. Ecotoxicology and Environmental Safety.*
[10] *Zou, X. (2023). Analysis of physical injuries caused by prolonged sitting behavior in college students. Sports Vision, 2023(04), 97-99.*
[11] *Mu, Z., Teng, Z., & Ji, J. (2022). Analysis of the impact of prolonged sitting behavior on physical activity. Sports Goods and Technology, 2022(23), 174-176.*
[12] *Wang, Y. (2021). Research on the design application of micro fitness products in "micro spaces" [Doctoral dissertation, Nanjing Art Academy].*
[13] *Chen, Z. (2022). Design of health sitting posture aids for sedentary office workers [Doctoral dissertation, Central South University of Forestry and Technology].*
[14] *Luo, X., & Yu, J. (2022). Research on physical fitness training courses for sedentary populations. In Proceedings of the First "Belt and Road" International Physical Fitness Summit Forum [Publisher not specified], 144-145.*
[15] *Zhao, J., Song, K., Dai, Z., et al. (2020). A review of ergonomics research on office furniture. Furniture and Interior Decoration, 2020(12), 38-39.*