

Review Article

Gamifying Exercise in the Elderly

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Abstract

Gamification of exercise in the elderly is a promising approach to promoting physical activity and improving overall health outcomes. By integrating game elements into exercise routines, seniors experience increased motivation, adherence and enjoyment, which leads to improved physical and cognitive health. Strategies for implementing gamification into exercise programs involve game design, personalization and feedback mechanisms.

Keywords: Physical Activity; Muscle-Strengthening Exercises; Gamified Mobile Service; Fitbit Wearable

Introduction

Physical activity forms the foundation of good health throughout life. The Centers for Disease Control recommend that most adults get 150 minutes a week of moderate-intensity aerobic exercise and engage in muscle-strengthening exercises two or more days a week [1]. Regular exercise remains the dominant way to prolong a healthy lifespan, maintain well-being and increase life satisfaction. Physical activity is crucial for maintaining health and life satisfaction, especially among the elderly [2]. Despite these significant benefits of regular exercise, only about 15% of adults in the US over 65 years old get the recommended minimum amount of exercise [3]. Motivating elderly individuals to engage in regular physical activity can be challenging [4].

Gamification, which involves applying game elements in non-gaming contexts, has shown promise in improving motivation and engagement in various domains, including health behaviors [5]. By integrating game elements and mechanics into exercise routines, seniors can

experience increased motivation, engagement and enjoyment, enhancing adherence and long-term benefits.

Gamification provides goals, challenges and rewards, which can make exercise more enjoyable and engaging. Making exercise feel like a game makes it easier to create long-term habits, leading to improved adherence rates and long-term health benefits. Additionally, games are helpful in stimulating cognitive functions such as memory, attention and problem-solving skills [6,7].

Increasing Physical Activity

Wearable fitness devices like Fitbit, Apple Watch and Garmin track physical activity throughout the day and evaluate sleep quality at night. These devices employ gamification techniques, including improved fitness tracking, step challenges, virtual group activities, awarding badges on their websites and providing personalized feedback based on activity data. Simple pedometers can also gamify walking and running by offering enhanced tracking capabilities compared to time-based or distance-based monitoring. These techniques for increasing activity have been clinically validated and continue to provide researchers with essential activity data.

Wearables enable better activity tracking and this gamification technique alone has been shown to increase activity. A systematic

review of 26 studies involving 2,676 participants found that users increased their daily step count by simply using a pedometer to track their activity. On average, users increased their daily steps by over 2,000 during a mean follow-up period of 18 weeks. Furthermore, compared to controls, those using a pedometer could lower their weight and blood pressure to healthier levels [8]. One randomized trial examined the effect of a Fitbit wearable compared to a pedometer alone. The researchers studied 51 inactive, postmenopausal women who were slightly overweight based on their body mass index. The primary outcome measured was the change in activity at the 16-week follow-up. The Fitbit group utilized a web-based tracking and feedback system in addition to the tracking provided on the device. While the pedometer-only and Fitbit groups underwent a goal-setting exercise, the Fitbit group also received personalized feedback on their activity levels on the website. This simple improvement in activity tracking resulted in increased activity in the Fitbit group, while no significant changes in activity were observed in the pedometer-only group [9].

People facing health challenges also appear likely to benefit from the improved physical activity tracking provided by pedometers. A study involving 97 individuals with chronic obstructive pulmonary disease found that using a pedometer increased 3,080 daily steps during the 3-month study period. In contrast, those who did not use a pedometer increased their daily step count by 138. Additionally, the pedometer group improved quality of life measures [10].

Gamification combined with routine nudges can also be beneficial in the workplace. A study involving 298 office workers examined this approach. The intervention group received a gamified digital app with social support features and digital nudges to encourage movement. The intervention resulted in increased step counts among participants. However, the study did not achieve long-term maintenance of these changes. The researchers emphasized the importance of further developing gamification techniques and rigorously evaluating their effectiveness [11].

Improving Mental Health

Exercise in the elderly has also been shown to have important benefits not only to physical health but also to cognition and mental health [12]. By exercise gamification, essential advances can be made in preventing or delaying cognitive decline. Gamification studies on exercise have found that mental health improvements occur alongside exercise improvements. A small study utilizing a phone app with tracking gamification was found to help provide a unique, personalized digital phenotype for patients. The results were that mental health issues could be primarily explained by physical activity in some patients, sleep patterns in other patients, or some other variable. This was hypothesized to be important in personalizing therapy recommendations [13].

Life Satisfaction

There is limited evidence that digital gamification apps may help improve life satisfaction. In one study of 198 men, the intervention group received access to a gamified mobile service. While both the intervention group and the control group had increased life satisfaction by six months, there was some evidence that the intervention was particularly helpful in men with low physical activity and high sedentary behavior at baseline [14].

Another study examined the effect of using a gamified website versus a pedometer versus a control group. The group of elderly people using the gamified website had a better engagement, greater autonomy and more enthusiasm for exercise [15].

Conclusion

Gamification as an intervention to promote regular exercise among the elderly proves to be a practical and valuable approach. It has been demonstrated to elevate physical activity levels, potentially enhance mental health and increase life satisfaction. While the overall benefits may be modest, they are still significant. However, further exploration of specific gamification techniques is warranted due to the diversity of outcomes observed. Notably, there is considerable potential in recognizing an individual's digital phenotype and tailoring medical care accordingly.

Conflict of Interest

The author has no conflict of interest to declare.

References

1. US Department of Health and Human Services. Physical activity guidelines for Americans, 2nd Edition. 2018.
2. Reimers CD, Knapp G, Reimers AK. Does physical activity increase life expectancy? A review of the literature. *J Aging Res.* 2012;2012:243958.
3. Office of Disease Prevention and Health Promotion. Announcing the physical activity guidelines midcourse report on older adults! Health.Gov. 2023 [Last accessed on: July 17, 2023].
<https://health.gov/news/202306/announcing-physical-activity-guidelines-midcourse-report-older-adults>
4. Cavill N, Kahlmeier S, Racioppi F. Physical activity and health in Europe: evidence for action (A EURO Publication). World Health Organization. 2006.
5. Lister C, West JH, Cannon B, Sax T, Brodegard D. Just a fad? Gamification in health and fitness apps. *JMIR Serious Games.* 2014;2(2):e9.
6. Goh DHL, Razikin K. Is gamification effective in motivating exercise? In: Kurosu M, editor. *Human-Computer Interaction: Interaction Technologies*. Cham: Springer International Publishing. 2015;608-17.
7. Park H, Park JH, Na HR, Hiroyuki S, Kim GM, Jung MK, et al. Combined intervention of physical activity, aerobic exercise and cognitive exercise intervention to prevent cognitive decline for patients with mild cognitive impairment: a randomized controlled clinical study. *J Clin Med.* 2019;8(7).
8. Bravata DM, Smith-Spangler C, Sundaram V, Gienger AL, Lin N, Lewis R, et al. Using pedometers to increase physical activity and improve health: a systematic review. *JAMA.* 2007;298(19):2296-304.
9. Cadmus-Bertram LA, Marcus BH, Patterson RE, Parker BA, Morey BL. Randomized trial of a fitbit-based physical activity intervention for women. *Am J Prev Med.* 2015;49(3):414-8.
10. Mendoza L, Horta P, Espinoza J, Aguilera M, Balmaceda N, Castro A, et al. Pedometers to enhance physical activity in COPD: a randomised controlled trial. *Eur Respir J.* 2015;45(2):347-54.
11. Mamede A, Noordzij G, Jongerling J, Snijders M, Schop-Etman A, Denktas S. Combining web-based gamification and physical nudges with an app (movemore) to promote walking breaks and reduce sedentary behavior of office workers: field study. *J Med Internet Res.* 2021;23(4):e19875.
12. Callaghan P. Exercise: a neglected intervention in mental health care? *J Psychiatr Ment Health Nurs.* 2004;11(4):476-83.
13. Wisniewski H, Henson P, Torous J. Using a smartphone app to identify clinically relevant behavior trends via symptom report, cognition scores and exercise levels: A case series. *Front Psychiatry.* 2019;10:652.
14. Pyky R, Jauho A-M, Ahola R, Ikäheimo TM, Koivumaa-Honkanen H, Mäntysaari M, et al. Profiles of sedentary and non-sedentary young men - a population-based MOPO study. *BMC Public Health.* 2015;15:1164.
15. Kappen DL, Mirza-Babaei P, Nacke LE. Older adults' motivation for physical activity using gamified technology: an eight-week experimental study. In: Gao Q, Zhou J, editors. *Human aspects of IT for the aged population healthy and active aging: 6th International conference, ITAP 2020, held as part of the 22nd HCI international conference, HCII 2020, Copenhagen, Denmark, 2000 Proceedings, part II*. Cham: Springer International Publishing. 2020;292-309.

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