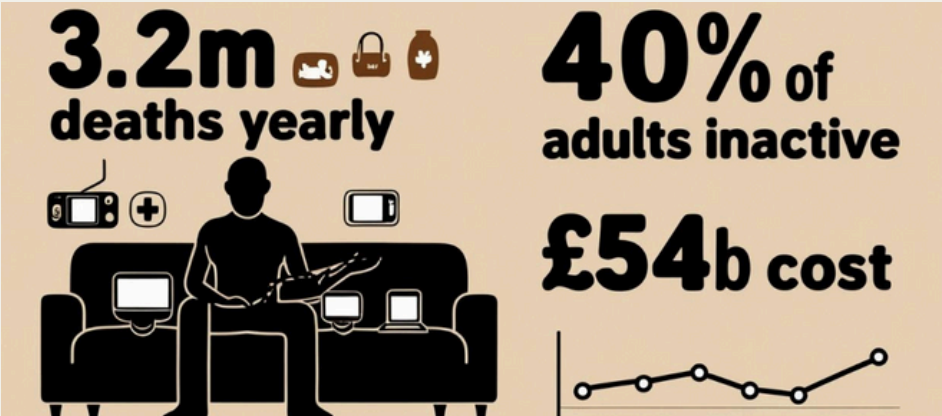


BLOG 1 HOW FITNESS WEARABLES ARE REVOLUTIONIZING PHYSICAL ACTIVITY PROMOTION IN PUBLIC HEALTH

THE PHYSICAL INACTIVITY CRISIS

- The high scale of global physical inactivity has become a dangerous threat that generates many significant public health issues.
- The World Health Organization (2022) reports approximately 3.2 million deaths annually worldwide due to physical inactivity.
- The British Heart Foundation (2017) reported that more than four out of ten UK adults have not achieved their recommended physical activity targets.
- Physical inactivity expenses the health sector £53.8 billion annually (Ding et al., 2016).
- People aged 65 and above represent a disproportionately high number of cases regarding physical inactivity compared to younger age groups because they follow physical activity recommendations at only 21% (Public Health England 2023).
- Health organizations require fresh approaches toward physical movement promotion to sustain public health achievements.



Physical Inactivity statistics (Public Health England, 2023)

SUCCESS STORY AND EVIDENCE

The efficacy of fitness wearables in promoting sustained physical activity is increasingly supported by research. Albergoni et al., (2019) demonstrated that 63% of wearable users maintained increased physical activity levels for over 12 months. Similarly, Jossa- Bastidas et al. (2021) found that fitness app reminders increased exercise adherence by 47% compared to control groups.



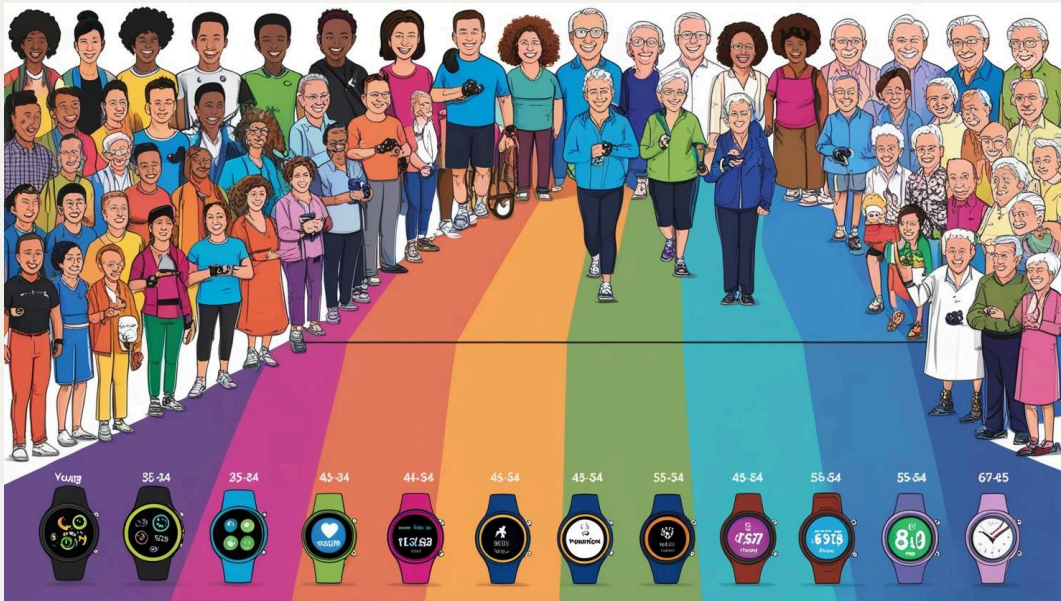
Sarah Fitness Journey (Legion Athletics, 2023)
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Key Advantages

- Real-time feedback allows users to change their behaviour as soon as it is provided
- The integration of gamification elements boosts user motivation because it offers both clever challenges and worthwhile incentives to users.
- Social features create community accountability
- Visual representations in the system provide users with progress tracking capabilities.
- A comprehensive health overview becomes achievable through integration of additional health measurement systems

Significant Limitations

- People face expenses to buy fitness wearables which cost between \$150 and \$350.
- Elderly people together with lower-income groups demonstrate lower adoption rates of digitally available services.
- Privacy issues emerge because of data collection practices as well as sharing agreements
- The system produces between 10% to 15% measurement errors for step counting and calorie estimation.
- Long-life batteries fail to enable real-time observation



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PODCAST:

Expert Insights on Wearable TechnologyFor an in-depth discussion on this topic, listen to this informative podcast: <https://podcasts.apple.com/in/podcast/wearable-health-monitoring-empowering-individuals/id1765391261?i=1000696963577> this episode, health technology experts explore how wearable devices are democratizing health monitoring and creating new opportunities for preventative care. The discussion covers both individual benefits and wider public health implications, with practical insights for healthcare practitioners interested in integrating wearable data into their practice.



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FITNESS WEARABLES: TECHNOLOGY FOR ACTIVE LIVING

- Fitness wearables (smart watches, activity trackers, fitness bands) stimulate physical activity promotion
- Market growth: 533.6 million units shipped in 2023
- IDC (2024) predicts market will reach £90 billion by 2026 (Statista, 2024)
- Wearables monitor four main health attributes: step count data, heart rate measurements, sleep data, stress readings
- Devices provide instant feedback about physical activities
- Generate ongoing awareness of movement levels
- Enable quick behavioral shifts
- Franssen et al. (2020) found Fitbit devices boost physical activity
- Users record 2,500-step average daily increase after 6 months of use

Sarah's Story: From Sedentary to Active

- Sarah, a 28-year-old office worker, exemplifies the transformative potential of fitness wearables. Before using a fitness tracker, Sarah averaged just 2,300 steps daily and experienced frequent fatigue. Six months after adopting a fitness wearable:
- Daily step count increased from 2,300 to 8,500
- Resting heart rate decreased from 78 to 68 bpm
- Sleep quality improved from 5.5 to 7.2 hours of quality sleep
- Weight decreased by 4.5kg
- Self-reported energy levels improved significantly
- The continuous feedback from her device helped Sarah identify periods of inactivity during her workday, prompting her to incorporate short walking breaks and take stairs instead of elevators.
- The social challenges feature connected her with colleagues, creating accountability and friendly competition that sustained her motivation beyond the initial novelty period.

Comparisons				
Brand model	Fitbit Charge 6	Morepro V19Pro	Whoop 4.0	Apple Watch Series 9
Price	\$159.90	\$84.90	\$239.00	\$329.00
Rating	4.1/5	4.5/5	4.0/5	4.7/5
Health monitor	HR+RR+ECG+SPO2	BP+RR+HR+ECG+SPO2	HR+RR+SPO2	HR+ECG+RR+SPO2
Built-in GPS	YES	YES	YES	YES
Water proof	SATM 50m	3ATM 30m	IP68 10m	SATM 50m
Battery Life	5 days	5 days	5 days	1 day
Subscription fee	YES	No	YES	YES
More advantages	Stylish design 50m Water proof	Blood pressure monitor No Subscription fee Accurate tracking data	Sleep monitoring Sports coaching	Stylish design 50m Water proof

Comparison of Wearables (Macrofactor, 2024)

Addressing the Shortfalls

A number of strategic measures can enhance the effectiveness of wearable fitness tools as public health resources by overcoming present constraints.

- Subsidized programs through healthcare providers and insurance companies
- Low-cost solutions need development for communities without access to proper healthcare resources.
- Clearer data privacy policies and improved user control
- Public health partnerships with wearable companies
- The integration of better sensors represents a solution to overcome precision problems.

Fitness wearable devices stand as a promising avenue in digital health promotion since they help deliver customized methods to prevent physical inactivity. The technological improvement and accessibility escalation increase the pace at which physical activity promotion transformations are reaching reality.

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DESCRIPTION OF DESIGN TECHNOLOGY (GAME AGE)

- Platform Type: Mobile and web-based platform for older adults (65+).
- Digital display features usability through its voice command functions and large accessible interface that solves common user obstacles according to Pang et al., (2021) and Arkkukangas et al. (2021).
- Physical Activity Tracking: Combines tracking with social community elements.
- The application employs gamification through its combination of points systems alongside badges and community competitors and leaderboards (Koivisto & Malik, 2021).
- Wearables through simple fitness bands enable users to monitor activities which improves their participation rates (Xu et al., 2022).
- Users can join an interactive virtual network which enables them to engage with others in real-life activities through the platform.
- Users can initialize teams to collaborate for reaching shared objectives.
- Participants can obtain actual rewards through business partnerships with local organizations.
- Events and challenges occur frequently in the platform as a way to keep members actively involved in the community.



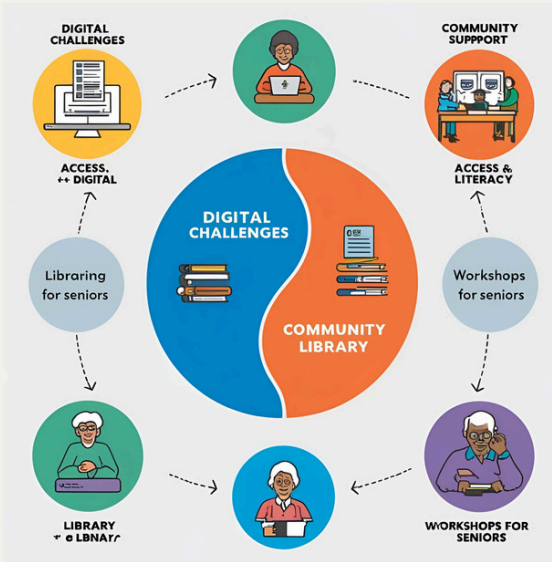
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ADVANTAGES OF GAMEAGE

- This innovative design approach targets elderly individuals while addressing their special requirements as stated in (Pang et al., 2021).
- Digital & Social Interaction: Combines digital engagement with real-world social interaction.
- The program adopts evidence-based principles that use research-proven behavior change methods (Arkkukangas et al., 2021).
- Health Determinants: Addresses both physical and social health determinants.
- Adaptability: Adaptive to various mobility levels and health conditions.
- Intergenerational Connection: Promotes family involvement (Hossen, Pauzi & Salleh, 2023).
- Healthcare System Integration: Potential for monitoring and intervention within healthcare systems (Chau et al., 2023).

DISADVANTAGES/SHORTFALLS

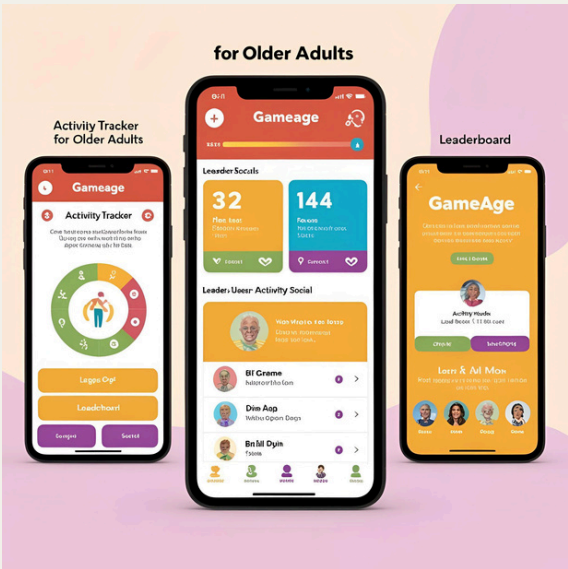
- Digital Literacy: Barriers due to low digital literacy among some older populations (Pang et al., 2021).
- High maintenance expenses together with a costly implementation process.
- Individuals facing problems because they do not possess either smartphones or internet access encounter barriers in accessing digital opportunities.
- Privacy Concerns: Data security issues, particularly with health-related applications (Chau et al., 2023).
- Users need to stay active with the system for the program's advantages to remain effective.
- The exclusion criteria consists of overlooked oldest-old individuals alongside the physically restricted population.
- Community Partnerships: Requires collaboration and additional resources for implementation.



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PUBLIC HEALTH PROBLEM AND CONCERNS

- Older adults who are aged 65 and above face a major public health problem due to their physical inactivity (National Health Service, 2023).
- Between 28% and 34% of adults in the age group 65-74 follow physical activity guidelines and among adults 75 and older the rate is 35-44% (National Health Service, 2023).
- World Health Organization (2020) demonstrates that lack of movement leads to four major health risks including cardiovascular diseases, Type 2 diabetes, cognitive deterioration with premature death outcomes.
- The health of older adults deteriorates severely because of social isolation which affects around 40% of this population (Hossen, Pauzi and Salleh, 2023).
- Social engagement emerges as a proven factor for enhancing health results among community-based older adults based on research findings by Liebzeit et al. (2022).
- Research indicates COVID-19 escalated physical inactivity among elderly adults by 27% according to White, Martin and White (2023).
- Public healthcare systems in the United Kingdom bear annual costs worth £0.9 billion due to inactivity among the population.



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HOW GAMEAGE ADDRESSES THE PUBLIC HEALTH PROBLEM

- The system implements gamification elements and social features to amplify motivation according to Xu et al. (2022).
- Personalized Activity adopts a user-tailored method to generate exercise suggestions based on personal abilities and preferences according to Chau et al. (2023).
- Community Engagement: Creates a sense of belonging through virtual and real-world connections.
- The system presents clear goals that give users instant feedback according to Liebzeit et al.'s (2022).
- Health Education within the system provides users with suitable exercise recommendations according to their physical fitness quality.
- Healthcare Integration allows patients to establish connections with medical providers who give individualized suggestions.
- The platform presents two alternatives for participation including home-based physical activities and community-based physical activities.
- Nutrition Guidance: Includes meal planning tools for older adults (White, Martin & White, 2023).



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ADDRESSING SHORTFALLS

- The platform delivers complimentary workshops which teach users how to function within its system per Pang et al. (2021).
- Simplified Interface: Features a simplified interface with extensive accessibility options (Arkkukangas et al., 2021).
- Subsidy Programs: Provide subsidies for low-income older adults and partner with community centers and libraries for access.
- Offline Functionality: Allow offline usage for areas with poor connectivity.
- The system should use privacy-by-design principles to establish visible data privacy guidelines (Chau et al., 2023).
- The system features adaptive components which allow users of different physical and cognitive abilities to join. This achieves complete inclusivity.
- A community volunteer support program should be implemented for maximizing onboarding assistance and support (Hossen, Pauzi & Salleh, 2023).

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PORTFOLIO: GAMEAGE: DIGITAL HEALTH PROMOTION FOR OLDER ADULTS

ADDRESSING PHYSICAL INACTIVITY THROUGH COMMUNITY-BASED DIGITAL GAMIFICATION

BACKGROUND

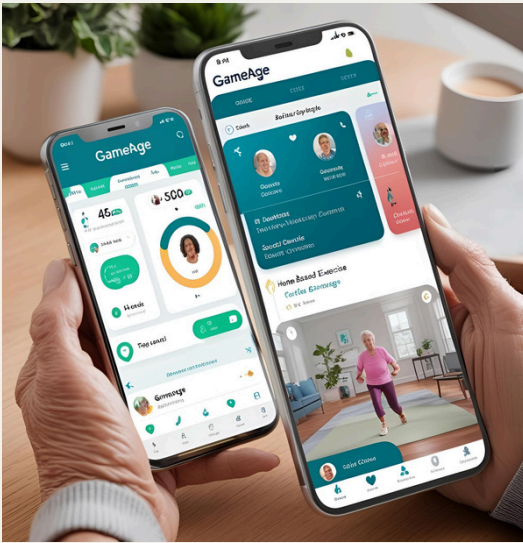
- Statistical research shows that fewer than 30% of aged 65 to 74 adults and less than 35% of adults aged 75 and older achieve physical activity standards (NHS, 2023).
- The impact on health becomes worse due to physical inactivity which raises the chance for heart diseases together with Type 2 diabetes, cognitive deterioration and shorter life spans (Dogra et al., 2022).
- Healthcare costs related to inactivity amount to £0.9 billion annually throughout UK healthcare systems.
- COVID-19 has resulted in a 27% rise in the number of inactive older adults (White et al., 2023).

Previous Interventions

- Community exercise programs
- Prescribed physical activity schemes
- Educational campaigns
- The study used home-based exercise programs as described in Ghram et al. (2021).

GameAge Platform:

- Mobile and web-based platform with gamification elements
- Combines activity tracking with social community features
- The device features interface elements that are easy to use while also supporting voice command capabilities.
- Personalized activity recommendations



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Health Promotion Principles & GameAge Alignment



BEHAVIOURAL EXCHANGE THEORY

Self-Determination Theory (SDT) (Ryan & Deci, 2020):

three fundamental psychological needs to feel most motivated:

- Autonomy: Sense of choice and control
- Competence: Feeling of mastery and effectiveness
- The need for relatedness operates through connection and belonging to mutual connections.

GAMEAGE IMPLEMENTATION OF SDT:

Autonomy support:

- User-chosen goals and activity options
- Personalized recommendations based on preferences
- The ability to determine participation levels exists per Davis et al. (2015).

Competence building:

- Progressive challenges adapted to ability
- Immediate feedback on performance
- According to Koivisto & Malik (2021) users achieve recognition through the award of badges and points.

Relatedness enhancement:

- Virtual communities connecting isolated seniors
- Team challenges fostering cooperation
- Senior citizens can participate in physical meetups that allow them to interact with others in the same location (Schwarz et al., 2024).

CONCLUSION

Policy Implications:

- Healthcare organizations should establish reimbursement systems that pay for effective digital health intervention.
- The organization must establish regulations to ensure digital access fairness for senior citizens.
- Healthcare organizations need to set up guidelines for creating friendly digital health applications for elderly users (Stark et al., 2022).

Educational Implications:

- The training of health practitioners must cover digital health tools made for older population use.
- Higher education about digital technology should be offered to older adult audiences.
- Community services should take steps to integrate digital health education into their operations (Dong et al., 2023).

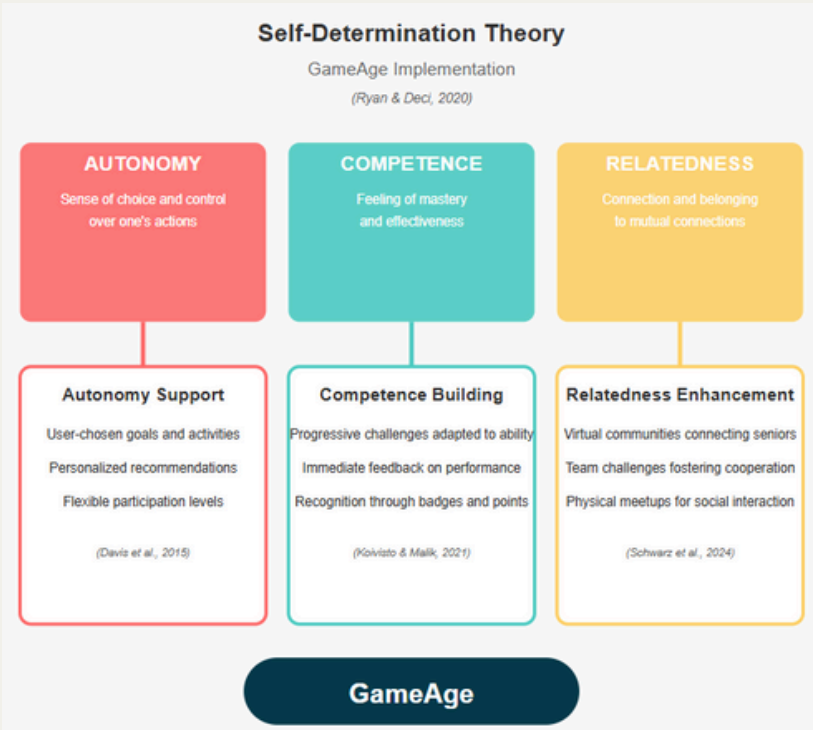
Research Directions:

- To perform long-term assessments about how behaviour transformations maintain themselves.
- Evaluate cost-effectiveness of gamified interventions
- The goal of research should examine different methods to provide digital access to older adults who are excluded from the internet.
- Researchers need to develop modifications that fit different cultural groups (Choukou et al., 2021).

GameAge demonstrates potential as a physical inactivity solution through its application of evidence-based behavioural theory together with technological integration and its emphasis on personal freedom and core competence and social fulfilment.

HEALTH PROMOTION VALUES AND PRINCIPLES

- For users with dexterity problems, I designed interface design in the form of large touch targets (no smaller than 14 mm), high contrast color scheme (4.5:1 ratio), and voice commands (natural language input) functionality.
- Points Structure: Tiered reward system, 5 per 1,000 steps, 20 for social participation, and 50 for competing weekly challenge which can be used at local partner business.
- Video Calling: Easy one touch connect to anyone, anywhere, and new community forums topped with interest topics for spreading these new messages around the world and synchronizing with local event coordination using built in calendar integration.
- Price range: Fit with affordable fitness bands (<£30 to £50), steps, sleep quality and heart rate, week trend analysis.
- AI-enabled recommendation system which adapts exercise difficulty by the user performance and provides different difficulty levels for each type of exercise.
- and Exercise instructions is cached up to 7 days and synced automatically when internet is available.
- Interactive tutorials with video demonstrations of exercises, each exercise tailored for seniors with mobility restrictions, with seated and standing options. There are also exercises to be completed while standing on wheels and while standing on a foam pad.
- Other services include sharing of activity summaries with healthcare providers through secure NHS compatible reporting tools and medication reminder system.



EXPECTED OUTCOMES

Anticipated Results:

- The program aims to generate physical activity growth reaching 35–40% among participants six months from initiative onset.
- 70% retention rate (vs. 20–30% in traditional programs)
- Enhanced intrinsic motivation for sustained behavior change
- Reduced social isolation through meaningful connections
- Improved health metrics: cardiovascular health, cognitive function (King & King, 2010)

Critical Considerations:

- Stronger outcomes in communities with existing social infrastructure
- The segment comprising individuals above 85 years needs supplemental assistance in their efforts.
- Digital literacy barriers establish restrictions regarding effectiveness among certain population segments (Tappen et al., 2022).
- Low-income participants within the research need additional assistance for technology access to ensure their participation in studies.

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