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Game On: Staff Insights into Gamified Exercise for Long-Term Care Residents Living with Dementia

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Abstract: Background/Objectives: The aging population presents significant challenges to healthcare systems, with conditions like dementia severely affecting the quality of life for older adults, especially those in long-term care. Gamification has the potential to motivate older adults to engage in exercise by transforming physical activities into enjoyable experiences. Incorporating gaming elements in cycling exercises can foster a sense of interest and achievement, potentially improving health outcomes. This study aims to explore interdisciplinary staff perspectives on using a digital game to motivate cycling exercise among residents living with dementia in long-term care (LTC). **Methods**: This study applied a qualitative description design. Using an interpretive description approach, we conducted focus groups with 29 staff members, including recreational therapists, rehabilitation therapists, nurses, care aides, and leadership in an LTC home. The consolidated framework for implementation research (CFIR) guided the data analysis to identify barriers and facilitators to adopting the digital game. **Results**: Engaging LTC residents living with dementia presents various challenges. Identified barriers to implementing the cycling game include cognitive and physical limitations, resistance to change, and intervention complexity. Frontline staff strategies include flexible invitations, social groups, making it fun, and building rapport. Success relies heavily on its cultural and individual relevance, along with strong support from leadership, peers, and family. **Conclusions**: Integrating gamification in exercise for older adults with dementia in LTC settings shows promise. However, addressing facilitators and barriers identified by staff is required. Successful implementation relies on tailoring interventions to meet residents' specific needs and preferences while addressing the identified challenges to maximize engagement and health benefits. This study adhered to the COREQ Checklist.

Keywords: gamification; older adults; dementia; exergame; long-term care

1. Introduction

The growing aging population poses substantial challenges to healthcare systems and economic sustainability, with potential repercussions for the well-being of older adults [1]. Conditions like dementia and frailty are especially harmful to the quality of life for older adults, particularly those living in long-term care facilities [2]. Regular exercise is widely regarded as one of the most effective methods for mitigating the decline in physical and cognitive abilities associated with aging [3,4]. It offers numerous benefits, including enhanced independence, fewer falls, and reduced psychological stress [5,6]. Nevertheless, encouraging older adults to adopt and sustain a consistent exercise routine remains challenging, as barriers such as low motivation, fear of injury, and environmental limitations often hinder participation [7,8].

Gamification refers to incorporating game elements into non-game activities to motivate people to participate in non-game activities [9]. In healthcare, gamification has primarily targeted children to engage them in physical exercise for fitness [10]. Recently, there has been growing interest in exercise games (exergames) to increase physical activity in older adults for improvement of function

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[11]. Gamification could be an effective strategy to motivate the participation of older adults living with dementia [9,12]. Due to technological advancements, video games have been integrated into the gamification of exercise [12].

In the last ten years, there has been a growth of studies on game technologies for the wellness of older adults [13]. The technologies have included the older adult populations in different settings, such as community [14] and hospital [15]. Gamification in exercise was found to benefit older adults by improving physical abilities, cognitive abilities (e.g., memories), and mental and emotional health (e.g., increasing positive mood and enhancing quality of life) [16]. It also enhanced older adults' socialization with others, although this was mentioned less because outcome measurements of related studies tend to focus on the individual instead of relational benefits [16]. Apart from positive health and psycho-social outcomes, game technologies have other benefits, such as providing older adults with a different activity environment and experience, better tracking of progress data, and being affordable for older adults and their service providers [12].

Recently, gamification in exercise has extended to older adults living with dementia in long-term care, especially since COVID-19 due to the increase in awareness of the needs of this population [15,17–20]. These studies examined the effectiveness of the technologies and found their benefits to the long-term care older adult populations, such as enhancing their cognition like memory, attention, and concentration [15,20], improving their physical functions such as balancing limb and body strength and flexibility [17], as well as facilitating psychosocial well-being [20]. Some studies have begun to examine the usability of exercise game technologies, focusing on both residents' and healthcare providers' perceptions. For example, Swinnen et al. [20] explored the implementation of an exercise game promoting standing balance. Residents reported enjoyment, confidence in the safety of the technology, and the alignment of the game's intensity and complexity with their physical and cognitive levels as the key motivations. Older adults in long-term care often require assistance from healthcare providers to use these technologies due to different limitations. Therefore, some studies also considered healthcare providers' perceptions of usability. For instance, in the rowing game of Muñoz et al. [19], healthcare providers suggested that providing cues helped residents living with dementia navigate a rowing game. In another study which implemented an exercise game platform called MouvMat, healthcare providers mentioned the benefits to residents, such as enjoyment, which motivated them to adopt the technology [18]. They also appreciated the ease of implementation, as their heavy workloads would not accommodate a complex game. For barriers, as the technology needed subscription, they were concerned whether the long-term care home had the necessary funding. Some also mentioned the potential fall risks associated with the game. A systematic review indicates that most research on exercise for older adults with dementia focuses on balance as an assessment criterion, highlighting the underrepresentation of residents in long-term care homes who are unable to bear weight [21]. This makes research on cycling games particularly significant, as it addresses the needs of this overlooked population.

While residents living with dementia are central to the exercise intervention, and their insights are crucial for understanding the acceptance of a gamified exercise program, activity provision is often regarded as the responsibility of specialist practitioners, such as occupational therapists or dedicated activity staff, within structured programs supported by all facility staff [22]. A systematic review highlighted that caregivers play a key role in promoting physical activity among residents with dementia [23]. Therefore, this study prioritized frontline staff as the primary source of perspectives. In the interprofessional context of long-term care, it was important to understand the voices of interdisciplinary voices, as each discipline brings unique strengths and limitations in identifying facilitators and barriers to implementing technologies for residents [24]. Some studies often focus on a single discipline, such as rehabilitation, with limited exploration of how interdisciplinary teams collaborate in the implementation process [19,20]. Nursing and leadership play a pivotal role in this context, as they can significantly influence the successful integration and sustainability of new technologies through effective team coordination and support [18,22].

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To address the literature gap regarding the limited knowledge of interdisciplinary healthcare providers and the exploration of team collaboration in implementing game technology for exercise in long-term care, we introduced a digital game for exercise called the cycling game in a long-term care home in Vancouver, Canada. We invited interdisciplinary healthcare professionals to offer their insights on implementing this technology with their residents. The objective of this paper is to explore the acceptability of a gamified cycling exercise for older adults living with dementia in a long-term care home. We wanted to understand the facilitators and barriers to implementation from the perspective of an interdisciplinary care team. The research question for this study is:

What are the barriers and facilitators to implementing cycling game technology for exercise in long-term care from the perspective of interdisciplinary staff?

2. Methods

2.1. Design

Our study adopts an Interpretative Descriptive [25] approach to explore the acceptability of the program implementation from staff members with different professional backgrounds and training. Qualitative data provide us with rich information explaining the reasons (the "why") and the approaches (the "how"). The focus group method was selected because of its ability to foster group synergy and encourage diverse opinions. Focus groups are frequently used in healthcare and are suitable to facilitate reflective discussion [26]. This approach aligns with the aim of gathering nuanced perspectives on the acceptability of program implementation from frontline staff with varied professional backgrounds and training. Our study adheres to the Consolidated criteria for reporting qualitative research (COREQ) by Tong et al. [27].

2.2. Study Settings and the Cycling Game

The study was conducted in a non-profit long-term care (LTC) home located in Vancouver, Canada. The LTC home can accommodate 200 multicultural residents. About 70 percent of residents live with dementia and other comorbidities. The staffing ratio is about one staff to ten residents.

The program was located at the recreation center of the care home. We installed a sensor on the cycling machine, an Active Passive Trainer (APT). The sensor captures the movement of a user's pedaling, which will be reflected on a large TV screen connected. See Figure 1.

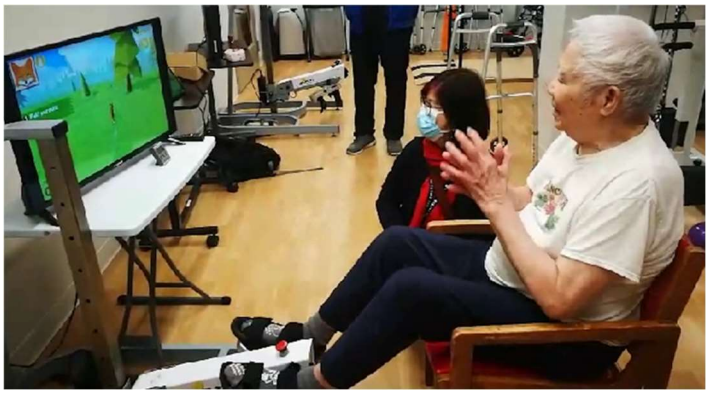

Figure 1. The gamified exercise equipment and programme.

The TV screen shows a gamified program designed to engage and motivate users to cycle. Throughout the program, the screen shows high-definition and vivid colors, accompanied by music with high-quality animations. The game starts with a forest scene with a fox. Researchers will brief the participant about the cycling game, ensuring the participant understands how to play the game: "I am the fox, and I catch rabbits." As the resident starts cycling, the fox begins to walk or run, its

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speed synchronizing with the resident's cycling pace. When a rabbit shows up and starts running, the resident cycles to catch the rabbit.

2.3. Sampling and Recruitment

The convenience sampling method [28] was used to invite all staff members from interdisciplinary backgrounds to yield useful information for the study question. We utilized posters and group emails to recruit participants. Inclusion criteria for participants are frontline full-time or part-time staff working in the care home with experience working with residents currently participating in regular exercise. Given the diverse composition of frontline staff, including many from racialized communities, proficiency in English was not a prerequisite. We had no exclusion criteria to encourage inclusivity. A demo video depicting a resident playing a cycling game was shared with participants before the focus groups. (https://www.youtube.com/watch?v=6J3q_kf6PEM).

2.4. Focus Group Questions

The questions for the semi-structured focus group are:

(1) What are the facilitators for implementing the cycling program for residents?
(2) What are the barriers to implementing the cycling program for residents?
(3) What resources could support you in implementing the program?

2.5. Data Collection

The project was led by the first author, LH, an experienced gerontological nurse in LTC for 15 years. Data was collected from 10 focus groups between April 2024 and June 2024 during work time. Each focus group had between two and seven participants, depending on the participants' availability and workload. YZ and JL conducted the focus groups in the nursing stations of the care home. Each focus group interview lasted 15-60 minutes, depending on the group's size, and was audio-recorded and transcribed verbatim. Also, field notes were used during the group sessions to document non-verbal cues and other contextual factors that might impact the conversation. YZ is an Asian male health leadership and policy graduate with an MD degree. JL is an undergraduate student in Cognitive Science. All data collection activities by trainees were supervised by LH, the principal investigator of the study, a female Asian professor in nursing.

2.6. Data Analysis and Theoretical Framework

The consolidated framework for implementation research (CFIR) informed our data analysis, which was an iterative process. For example, during the analysis, we repeatedly revisited the data to refine our understanding of how contextual factors in the inner setting of the care home influenced the success of gamified exercise programs in long-term care settings. The team followed the six-step approach for thematic analysis by Braun and Clarke [29]. Step 1: YZ and JL transcribed the data, and the team familiarized itself with the data. Step 2: YZ and JL performed initial analysis and generated initial codes. Transcripts, quotations, and codes were managed using NVivo version 14.0. A hierarchical coding system was developed and refined using the CFIR framework, the focus group guides, and a preliminary review of transcripts. Step 3: Based on the codes, YZ and JL searched for themes. Step 4: YZ presented themes to student authors JW, KW, LR and NC, and all student authors reviewed themes. JW is an Asian female PhD student in nursing. KW is an Asian female PhD student in social work. LR is an Asian female PhD student in interdisciplinary studies, nursing and occupational therapy. NC is an Asian female family partner of the research team. A family partner is a family caregiver of an older adult living with dementia. Step 5: YZ and JL defined and named themes. Step 6: YZ, KW, JW, LR and JL wrote the first draft, and all authors agreed with the final draft. LH guided student authors throughout this data analysis. Findings were shared with all participants.

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2.7. Ethical Considerations

This research was approved by the Office of Research Ethics at the University of British Columbia (H24-00010). All participants provided a written consent form containing details about the research, including its purpose, potential benefits, the risks involved, and the right to withdraw from the study. To ensure confidentiality, pseudonyms were used to anonymize participant identities.

2.8. Rigor

We implemented several measures to ensure rigor in this study. Our team embedded reflective discussions in weekly research meetings and maintained reflexivity notes to assess our assumptions critically. We involved multiple researchers who collaborated on coding, analysis, and interpretations. Detailed research documentation, including a thick description of data collection and analysis processes, was maintained to monitor progress and establish an audit trail. These practices aimed to promote accountability and transparency throughout the research.

3. Results

3.1. Participants

The study included 29 participants from various professional backgrounds, with nurses (34.5%) and care aides (31.0%) representing the largest groups (See Table 1). Recreational therapists (20.7%) and rehabilitation therapists (10.3%) also participated. Notably, the leadership group comprised four nurses, one rehabilitation therapist, one recreational therapist, and one manager. The gender distribution was predominantly female (82.8%), with males making up 17.2%. Participants' ages ranged from 20 to 60 years, with the largest age group being 50-60 years (34.5%), followed by 30-40 years (27.6%), 40-50 years (24.1%), and 20-30 years (13.8%). This diverse demographic provided a comprehensive perspective on the implementation of the gamified cycling program.

Table 1. Demographic Characteristics of Participants (n=29).

Category	Number	Percentage
Roles		
Recreation	6	20.7%
Rehabilitation	3	10.3%
Nurse	10	34.5%
Care aide	9	31.0%
Practice leader or director	7	24.1%
Gender		
Male	5	17.2%
Female	24	82.8%
Age group		
20-30 years	4	13.8%
30-40 years	8	27.6%
40-50 years	7	24.1%
50-60 years	10	34.5%
Total	29	

3.2. Barriers and Enabling Strategies

Our analysis identified three barriers to implementing the cycling game: cognitive and physical limitations (such as visual and hearing impairments), resistance to change, and intervention complexity.

3.2.1. Barrier: Cognitive and Physical Limitations

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As residents in LTC often present with complex health backgrounds, various impairments are frequently mentioned as the greatest barrier by the staff. In terms of physical impairment, residents may be reluctant to engage in gamified exercise interventions due to challenges such as vision and hearing impairment; many also have concerns about potential cardiovascular risks, such as increased heart rate and blood pressure.

> *"I feel like for residents that might struggle with like visual aids, there might be some complications and problems for them [playing the cycling game]."* (Group 3, John, nurse)

> *"The challenge is resident's conditions. When they do these exercises, their heart rate may increase. Their blood pressure will be impacted, which may be a worry among family members."* (Group 5, Ting, nurse)

Dementia is also cited by staff as a challenge. A substantial number of the residents are living with dementia, and they may not understand game rules, follow instructions, or maintain focus during gameplay. To address this problem, the recreational team suggests that cognitive pre-assessments can be conducted to ensure residents understand the intervention.

> *"There is nothing that keeps residents' focus on one thing."* (Group7, Mary, Leadership)

3.2.2. Barrier: Resistance to Change

Despite having an awareness of the numerous benefits of exercise, residents' reluctance to participate in exercise activities remains a significant barrier to implementing gamified exercise programs. Reasons shared by the staff include residents' resistance to change, timing of day for exercising, and low mood and energy. The staff mentioned that residents tend to maintain a sedentary lifestyle and often opt for sleeping over-exercising, posing a challenge to implementing gamified exercises.

> *"A lot of residents will need staff to encourage them to do exercises because sometimes they are kind of tired."* (Group 4, Lee, care aide)

> *"A lot of seniors who don't have the energy and mood. A lot of time they don't feel well. When they don't even want to eat, how can you ask them to exercise?"* (Group7, Martha, Leadership)

Staff also shared that some residents are new to the care home. They refuse to join exercise activities due to unfamiliarity with the new environment.

3.2.3. Barrier: Intervention Complexity

Staff worried about the complexity of the game, which might be overwhelming for their residents who are unfamiliar with technology.

> *"The residents will have a lot more questions. Even though it's as simple as just pedaling... I have to explain what's on the screen [to the residents], such as to coordinate pedaling with the fox chasing a rabbit."* (Group 6, Scarlett, care aide)

Furthermore, cultural and language differences can also impede residents' ability to resonate with the game's content. Many residents in this LTC home have Asian backgrounds. In their culture, residents are not very familiar with the action of chasing a rabbit, which in turn may affect residents' understanding and engagement with the tasks in the game.

In addition to these challenges, the recreational team has expressed concerns about residents' limited familiarity with technology, which could hinder their ability to connect the game's objectives with their actions effectively.

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3.3. Enabling Strategies: Flexible Invitations, Social Groups, Making it Fun, and Building Rapport

Participants identified enabling factors for implementing the gamified exercise: flexible invitations, social groups, making it fun, and building rapport. Nurses and care aides underscore the importance of flexible invitations. Many mentioned offering multiple opportunities throughout the day for residents to join exercise sessions, allowing them to choose a time that suits their personal schedules and energy levels. Creating a more flexible schedule and inviting atmosphere is important for residents to participate at their own pace and convenience. From the perspective of staff, engaging in regular physical activity helps train residents' muscles, thereby increasing their independence and sense of control over their lives.

> *"Exercises can promote residents' autonomy because exercises are supposed to train their muscles to promote well-being and a sense of control. Residents can do something to improve their conditions."* (Group7, Jenny, Leadership)

Additionally, gamified exercises challenge residents to use more of their cognitive abilities, offering a mental workout that deviates from their routine activities.

> *"I feel like the cycling game is making them use more of their brain in a fun way."* (Group 3, Joe, nurse)

Furthermore, gamified exercises offer social engagement opportunities, fostering interaction and community building. The gamified exercise, conducted in small groups, could encourage residents to cheer for each other and share in the emotional highs and lows of gameplay, creating a supportive and interactive environment. Thus, this social aspect enhances the enjoyment and motivation of residents, contributing to their overall quality of life. The presence of peers who actively participate in exercise can motivate others to join in, thereby creating a supportive and engaging environment for physical activity and enhancing overall participation. Doing exercise together fosters a culture where exercise is normalized and encouraged. This culture shift can reduce resistance to participation and encourage more residents to engage in physical activities.

> *"Let this resident try it first, and the rest of the people can observe, and then they would join in."* (Group 4, Jen, nurse)

Staff emphasized the importance of building rapport for better acceptance. Incorporating cycling exercise into the daily routine can help establish trust and positive relationships. Family members can help advocate, plan, and support the cycling exercise. Participants suggested using culturally relevant elements in the game, which can become conversation starters. Discussing shared cultural interests can strengthen relationships and create a more supportive environment.

> *"The residents feel more engaged when they can relate themselves to the game. It will be nice to have culturally familiar elements in the gamified exercise, such as incorporating Mahjong-inspired visuals or themes, which can immediately capture residents' interest and make the activity more engaging."* (Group 1, Winnie, recreational therapist)

4. Discussion

This study investigated the staff perspectives on using a digital game to motivate cycling exercise among LTC residents. Our study results are similar to those of Meekes and Stanmore [30] in that older adults can be motivated to exercise by intrinsic factors (such as enjoyment during the game and perceived improvements in health and social confidence) and extrinsic factors (social interaction). Our findings are congruent with Muller et al. [31], who state that playing an exergame can be motivating but cognitively demanding as well. Our participants expressed concerns about residents' capacity to perform. Similar to the fox game in Muller's study, playing the game involves

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more than just making a specific body movement. Participants must interact with the game by pedaling with the fox's timing to catch the rabbits. They must pay attention to the locations of the rabbits and accelerate the pace accordingly. The dual task of playing the game and cycling requires increased cognitive processing. It can potentially offer cognitive stimulation and enhanced engagement. However, it can be cognitively demanding and potentially overwhelming for those with cognitive impairments, leading to confusion or disengagement. Future research should further investigate appropriate game settings to accommodate older adults with various cognitive changes.

Adherence is crucial for successful implementation. LTC residents can learn and improve their performance with support over time. Sondell et al. [32] found that motivation to exercise among people living with dementia increases over time. Gamified exercise can enhance this self-reinforcing feedback by providing additional attraction through various game elements, such as points/scores, trophies/badges, leaderboards, and achievements [13]. Once residents are motivated to start exercising, their interest may grow. The positive feedback loop of fun and achievement encourages residents to make exercise a routine. Short-term studies capture initial enthusiasm but may not reflect long-term engagement and adherence. Thus, studying exergames over a longer period is essential to understand motivation changes over time.

Our focus group data showed that physical and cognitive limitations present challenges for older adults participating in exercise programs. LTC staff are worried about the risk of injuries. Many residents have chronic conditions that can make physical activity hazardous if not properly supervised. Staff participants observed residents citing reasons such as fatigue, poor mood, and timing issues to avoid exercise. Safety concerns further limit participation due to the risk-averse culture in LTC, aiming to avoid liabilities. In our data, staff highlighted their reluctance to encourage "risky" residents to exercise, fearing the responsibility of medical emergencies such as falls and fainting. Gibson et al. [33] suggest assessing physical abilities like cardiorespiratory fitness, muscular fitness, body composition, flexibility, and balance before engaging older adults in exercise. Bechard et al. [34] remind us to recognize dementia heterogeneity and changes over time. Cognitive assessments and appropriate support are crucial to ensure residents can understand and engage with the intervention. Balancing safety and exercise benefits should be further explored in future LTC research.

Designing physical activity programs for culturally and linguistically diverse older adults is important. Including native language instruction and the adoption of familiar activities is recommended [14]. The "Choose to Move" (CTM) intervention for Chinese older adults in Canada emphasized prioritizing health concerns, family needs, and cultural familiarity [35]. These factors align with the strategies identified in this study, such as motivating residents with the health benefits of exercise and tailoring game content to cultural backgrounds.

This study serves as an excellent example of interdisciplinary research, showcasing a broad range of professional expertise. The diversity among team members enhances creativity, expands knowledge, and bridges understanding gaps [36]. The focus groups in this study yielded valuable insights from various professional perspectives on the barriers and facilitators to exercise engagement. For example, nursing staff emphasized the importance of family and peer support, while recreational therapists focused on the practical usability of interventions. Leadership roles highlighted issues such as interruptions due to medication schedules, demonstrating the comprehensive view offered by diverse team roles.

Despite these valuable contributions, there are clear opportunities for improvement through enhanced interdisciplinary collaboration to promote resident engagement in exercise. Recreational therapists reported challenges such as residents being occupied with eating or sleeping during scheduled exercise times. Nurses and care aides noted that residents' moods often improve with family visits, enhancing motivation for physical activities. By fostering better collaboration and information sharing among interdisciplinary teams, these challenges can be effectively addressed, leading to smoother and more consistent engagement of residents in exercise programs.

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4.1. Limitations

While this study provides valuable insights, it has several limitations. The study in one LTC home limits the generalizability of the findings. The culture of LTC homes varies significantly, with some adopting a more risk-averse approach while others are more innovative and willing to embrace new practices. These cultural differences may impact how each home addresses challenges and implements new programs. Future research should involve more diverse care homes (maximum variation). The perspectives of residents and families will be interviewed further during the implementation process. Additionally, this study focused on qualitative data; incorporating quantitative measures could provide a more comprehensive understanding of the interventions' effectiveness. Physical indicators like heart rate variability and emotional indicators like loneliness and happiness scales and quality of life will be included in the following study. Furthermore, research should also explore the long-term impacts of gamified exercise programs on residents' physical and cognitive health outcomes.

4.2. Practice Implications

Based on the insights shared by an interdisciplinary team working in long-term care homes, there are some lessons learned/ practical tips - "CYCLING" for frontline staff and leadership when planning and implementing gamified exercises in long-term care:

- **C**ollaborate: To encourage collaborative learning from interdisciplinary teams in long-term care settings on diverse perspectives on how to adapt and tailor interventions for diverse residents
- Say "**Y**es" to the game: To partner with industrial partners to simplify game content and incorporate culturally relevant content to motivate residents to say "yes" to participate in the exercise games (dementia-friendly design)
- **C**reate a supportive environment: To engage family members, residents' peers, and diverse staff in creating a supportive and inclusive environment to boost residents' participation rates
- **L**earn about benefits: To promote the benefits of residents' participation in the cycling games among staff and residents to enhance perceived benefits and fun aspects of the exercising games
- **I**dentify needs: To conduct pre-game assessments to ensure residents with diverse physical and cognitive capacities can be well supported and participate in these gamified exercises meaningfully
- **N**egotiate financial support and resources: To ensure ongoing financial support and resources for the exercising program to sustain its implementation by nursing leaders
- **G**ain insights from future research: To explore further research on the long-term impacts of gamified exercise programs on residents' physical and cognitive health outcomes by nurse researchers

5. Conclusions

Our study found integrating gamification in exercise for older adults with dementia in LTC settings shows promise. However, careful consideration of the barriers identified by staff is required. Successful implementation relies on tailoring interventions to meet residents' specific needs and preferences while addressing the identified challenges to maximize engagement and health benefits. This includes incorporating culturally relevant content, providing adequate staff training, and ensuring the activities are both enjoyable and accessible. Additionally, long-term studies are essential to understand how motivation and engagement evolve. Collaboration among interdisciplinary teams and ongoing support are crucial to creating an environment that fosters regular participation and enhances the overall well-being of residents.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org, Table S1: COREQ checklist.

Author Contributions: Conceptualization, L.H.; methodology, L.H. and Y.Z.; formal analysis, L.H., J.L., K.W., J.W., L.R. N.C., and Y.Z.; data curation, J.L. and Y.Z.; writing—original draft preparation, J.L., K.W., J.W., L.R.

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Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

LTC	long-term care
CFIR	consolidated framework for implementation research
COREQ	Consolidated criteria for reporting qualitative research
APT	Active Passive Trainer
CTM	"Choose to Move"

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