Barriers and facilitators to exercise practice in institutionalized older adults: a mixed-methods study

Barreras y facilitadores para la práctica de ejercicio en personas mayores institucionalizadas: un estudio de métodos mixtos

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Abstract

Introduction: Institutionalized older adults are among the most vulnerable segments of the population, often engaging in low levels of exercise. Exercise participation may be influenced by perceived barriers and facilitators, however, few studies have explored the impact of these determinants in this population.
Objectives: To identify and characterize the challenges, barriers, and facilitators to exercise participation as perceived by institutionalized older adults with diabetes.
Methodology: This study adopted a convergent mixed-methods design and was conducted in five institutions with 27 participants. Data collection followed a three-phase: administration of a sociodemographic and clinical questionnaire, focus group interviews, and quantitative assessment using the Exercise Benefits and Barriers Scale (EBBS).
Results: The sample included 9 women and 18 men, aged between 72 and 97 years. The main identified barriers were pain, fatigue, and physical limitations, perceived lack of time, and limited access to facilities. Key facilitators included enjoyment, positive emotions, social support, and improved mobility. Participants reported perceived benefits for both physical and mental health, while a major challenge was the limited recognition of exercise as a strategy for managing diabetes.
Conclusion: The management of diabetes in institutionalized older adults requires integrating exercise as a central component. Effective exercise programs in this population should combine educational interventions, appropriate physical environments, qualified healthcare professionals, and a supportive social network. This study contributes to the evidence base by identifying the multidimensional barriers and facilitators of exercise participation in this population, providing guidance for the development of more tailored and effective interventions.

Keywords

Barriers to exercise; diabetes; exercise facilitators; institutionalization; older adults.

Resumen

Introducción: Los adultos mayores institucionalizados se encuentran entre los segmentos más vulnerables de la población, y con frecuencia presentan bajos niveles de actividad física. La participación en ejercicio puede estar influenciada por barreras y facilitadores percibidos, sin embargo, pocos estudios han explorado el impacto de estos determinantes en esta población.
Objetivos: Identificar y caracterizar los desafíos, barreras y facilitadores para la participación en ejercicio, según la percepción de adultos mayores institucionalizados con diabetes.
Metodología: Este estudio adoptó un diseño de métodos mixtos convergente y se realizó en cinco instituciones, con un total de 27 participantes. La recolección de datos siguió tres fases: administración de un cuestionario sociodemográfico y clínico, entrevistas en grupos focales, y evaluación cuantitativa mediante la Escala de Beneficios y Barreras del Ejercicio (EBBS).
Resultados: La muestra incluyó 9 mujeres y 18 hombres, con edades entre 72 y 97 años. Las principales barreras identificadas fueron dolor, fatiga y limitaciones físicas, percepción de falta de tiempo y acceso limitado a las instalaciones. Los facilitadores clave incluyeron disfrute, emociones positivas, apoyo social y mejora de la movilidad. Los participantes reportaron beneficios percibidos tanto para la salud física como mental, mientras que un desafío importante fue el reconocimiento limitado del ejercicio como estrategia para el manejo de la diabetes.
Conclusión: El manejo de la diabetes en adultos mayores institucionalizados requiere integrar el ejercicio como componente central. Los programas de ejercicio efectivos en esta población deben combinar intervenciones educativas, ambientes físicos adecuados, profesionales de la salud calificados y una red social de apoyo. Este estudio contribuye a la base de evidencia al identificar barreras y facilitadores multidimensionales de la participación en ejercicio en esta población, proporcionando orientación para el desarrollo de intervenciones más adaptadas y efectivas.

Palabras clave

Barreras al ejercicio; diabetes; facilitadores al ejercicio; institucionalización; personas mayores.

Introduction

The increase in life expectancy, combined with scientific and technological advances, has led to a growing aging of the global population (Collado-Mateo et al., 2021). In line with this trend, Portugal has shown a significant rise in aging and longevity indices, which has been accompanied, however, by an increase in the dependency ratio among older adults (PORDATA, 2023). Although life expectancy has increased, people are living with greater physical and functional dependency, creating major challenges for health, social, and economic systems (PORDATA, 2023).

With increasing longevity and a growing older population, the demand for long-term care services continues to rise (Forster et al., 2017). Approximately one in four older adults resides in a Residential Structure for Older People (ERPI) during their final year of life (Forder & Fernandez, 2011). In this context, older adults often present high levels of physical inactivity, which is associated with negative effects on physical and psychological health, quality of life, and increased social isolation (Forster et al., 2017). Inactivity and sedentary behaviour also contribute to the rising prevalence of chronic diseases such as osteoporosis, obesity, depression, cardiovascular diseases, colon cancer, and diabetes (Schutzer & Graves, 2004).

Promoting physical and cognitive function is essential for healthy aging, making it a priority to develop strategies that encourage regular physical exercise (Collado-Mateo et al., 2021). However, a critical question emerges: why do many individuals, despite clear recommendations, remain physically inactive or fail to maintain regular participation in exercise programs? This highlights the need to explore the underlying factors behind this reality (Collado-Mateo et al., 2021).

Diabetes is a condition with an increasing global prevalence (Saeedi et al., 2019), represents a major public health concern. In Portugal, approximately 14.1% of the adult population has been diagnosed with diabetes (Che et al., 2022). Physical exercise is recognized as a key component of diabetes management, contributing to improved insulin sensitivity, aerobic capacity, muscular strength, body composition, and endothelial function (Whipple et al., 2019). Despite the recognized benefits of exercise in diabetes management, many individuals—particularly older adults—struggle to adopt and maintain regular physical exercise. An important factor influencing this behavior is the perception of exercise-related benefits and barriers, which can significantly affect motivation and adherence (Ersin et al., 2022). Although previous research has explored exercise behavior in older adults, there is a gap regarding institutionalized older adults with diabetes, particularly in the application of the socioecological model within a mixed-methods design. To address this gap, the present study applies the socioecological model proposed by McLeroy et al. (1988), which provides a comprehensive framework integrating multiple levels of influence—individual, interpersonal, organizational, community, and policy—reflecting the complex determinants of health-related behavior. This model was selected over other behavioral frameworks because it allows for the examination of interactions between personal, social, and environmental factors that shape exercise participation in institutionalized settings (McLeroy et al., 1988).

Based on this framework, the study hypothesizes that both individual and environmental factors significantly influence exercise participation among institutionalized older adults with diabetes, and that social support and institutional resources act as key facilitators.

Research questions:

1. What are the main barriers perceived by institutionalized older adults with diabetes that limit participation in exercise programs?

2. What facilitators enable or encourage regular exercise in this population?

3. What challenges are perceived by institutionalized older adults in managing and caring for their diabetes?

Thus, the present study aimed to identify and characterize the barriers and facilitators to exercise participation among institutionalized older adults with diabetes, as well as the perceived challenges in diabetes care management, providing evidence to guide the development of tailored interventions.

Method

This study used a cross-sectional, observational, sequential mixed-methods design. Qualitative data were collected first, followed by quantitative data in the subsequent month, with findings from both strands integrated during interpretation to provide complementary insights into exercise-related barriers and facilitators. Accordingly, a mixed-methods approach (qualitative and quantitative) was adopted to ensure complementarity in the analysis, allowing for a more comprehensive understanding of personal perspectives (Whipple et al., 2019).

Participants

Participants were 65 years or older, of both sexes, diagnosed with diabetes, and living in Residential Structures for Older People, according to predefined inclusion criteria ensuring sample homogeneity. Individuals who were unable to complete the measurement instruments due to functional limitations or medical conditions were excluded from the study. Additionally, individuals with neurological or cognitive impairments or language barriers that could compromise the understanding of the instruments, were also excluded. A formal a priori sample size calculation was not performed because the study had an exploratory, descriptive, and feasibility-oriented nature, and recruitment was constrained by the number of eligible residents with diabetes available in participating institutions during the data collection period. Although several long-term care institutions were contacted, only a limited number agreed to participate. Moreover, the restrictive eligibility criteria further reduced the pool of eligible participants. Therefore, a convenience sample was used, including all eligible and consenting residents across the five participating facilities. Twenty-nine institutionalized older adults diagnosed with diabetes were initially included after meeting eligibility criteria and providing informed consent; however, two participants withdrew — one due to leaving the institution and another due to declining participation in the second and third phases of the study — resulting in a final sample of 27 individuals. Participants' ages ranged from 72 to 97 years. The sample was recruited from five institutions located in the district of Leiria, during the period between February and April 2024.

Procedure

The study was reviewed and approved by the Ethics Committee of the Polytechnic Institute of Leiria. Before data collection, participants received clear information regarding the study aims, procedures, and their rights. Participation was voluntary, and participants could withdraw at any time without consequences.

Confidentiality was ensured throughout the research process. All questionnaires and interview transcripts were anonymized, and identifying information was removed. Audio recordings were securely stored and accessed only by the research team. All data were handled exclusively for research purposes and in accordance with institutional and ethical guidelines.

Data collection followed a structured three-phase procedure designed to ensure methodological consistency and alignment with the study objectives.

Phase 1 – Initial Assessment and Participant Characterization

During February, a trained researcher visited each participating institution according to its availability. After receiving detailed information about the study, eligible participants provided written informed consent. They then completed an individual assessment consisting of a sociodemographic and clinical questionnaire administered in a quiet room provided by the institution. Each session lasted approximately 20 minutes. Based on the information collected in this phase, participants were subsequently allocated into groups for the focus-group interviews conducted in Phase 2.

Phase 2 – Focus-Group Interviews

In March, semi-structured focus-group interviews were conducted online via Zoom. Three groups were formed based on the categorization completed in Phase 1. Each group included at least seven participants. A researcher moderated all sessions, accompanied by an institutional staff member. At the start of each interview, the moderator introduced themselves, explained the study purpose, outlined the procedures, and clarified how the data would be used. Participants then granted permission for audio recording. Each interview followed the same protocol and lasted approximately one hour.

Phase 3 – Quantitative Physical Assessment

In April, participants underwent individual assessments that included the administration of the Exercise Benefits and Barriers Scale (EBBS). All assessments were performed by the same trained researcher to ensure procedural consistency. Each session lasted about 30 minutes.

Instruments

Data were collected using three instruments: the Sociodemographic and Clinical Data Questionnaire (SCDQ), the Exercise Benefits and Barriers Scale (EBBS), and semi-structured focus-group interviews.

Sociodemographic and Clinical Data Questionnaire (SCDQ)

The SCDQ provided a detailed characterization of the study sample. It consisted of two sections. The first collected sociodemographic information, including age, sex, marital status, educational level, professional activity during the last 10 years before retirement, and duration of institutionalization. The second section addressed clinical characteristics, such as the main reported medical conditions, time since diabetes diagnosis, and diabetes type. The SCDQ enabled a comprehensive overview of participant profiles for subsequent qualitative and quantitative analyses.

Exercise Benefits and Barriers Scale (EBBS)

The EBBS is a validated psychometric instrument widely used to assess individuals' perceptions of exercise-related benefits and barriers (Sechrist et al., 1987). It includes 43 items divided into nine domains—five addressing perceived benefits and four addressing perceived barriers. Each item is rated on a 4-point Likert scale from strongly agree to strongly disagree. Total scores range from 43 to 172 points, with higher scores reflecting more positive perceptions of exercise. The EBBS has demonstrated strong psychometric properties across diverse populations, including older adults (Whipple et al., 2019).

Semi-Structured Focus-Group Interviews

Focus-group interviews were conducted to explore participants' perceptions and beliefs in depth. Each group consisted of 7–12 participants, following recommendations for qualitative research (Tong et al., 2007). Interviews were guided by a semi-structured protocol adapted from Whipple et al. (2019) and addressed two domains: participants' perception of health status related to diabetes, and perceived barriers and facilitators to exercise participation. The qualitative data provided insights into attitudes, experiences, and contextual factors influencing engagement in exercise.

All instruments were administered by a trained researcher. The SCDQ and EBBS were applied individually, while focus-group interviews were conducted in small groups, ensuring standardized procedures and reliable data collection. Together, these instruments allowed an integrated assessment of participants' characteristics, perceptions, and attitudes toward exercise.

Data analysis

Quantitative data were analyzed using SPSS (version 29). Descriptive statistics (means, standard deviations, frequencies, and percentages) were computed to characterize the sample and to describe EBBS total and subscale scores. Internal consistency of the EBBS was examined using Cronbach's alpha. Distributional assumptions were assessed through skewness and kurtosis values.

Qualitative data were analyzed using reflexive thematic analysis following the six phases proposed by Braun and Clarke (Braun & Clarke, 2006; Braun & Clarke, 2021). Two researchers were involved in the coding process, with coding and theme development conducted through iterative engagement with the data, reflexive interpretation, and collaborative discussion throughout the analytic process. Coding and theme development were performed manually.

To ensure analytic rigor, data saturation was monitored throughout the process by tracking the stability of themes, subthemes, and codes across the three focus groups. Saturation was progressively achieved as subsequent groups confirmed the thematic structure with minimal addition of new information. Following theme development, the identified factors influencing exercise participation were categorized into community-level, interpersonal, and individual-level factors according to McLeroy et al. (1988) conceptual model (McLeroy et al., 1988). Each researcher initially performed an independent

classification, and final categorization was reached through collaborative discussion, ensuring consistency and alignment with the theoretical framework.

Results

Sociodemographic and Clinical Characterization of the Sample

The sample comprised 27 institutionalized older adults residing in long-term care facilities in the Leiria region. Participants' ages ranged from 72 to 97 years (mean = 86.89; SD = 6.45), and the mean length of institutionalization was 4.11 years, as presented in Table 1. Most participants were male (66.7%), and the majority were widowed (77.8%). Regarding educational attainment, 25.9% had no formal education, although 22.2% were able to read and write. Among the remaining participants, 44.4% had completed primary education, 22.2% had completed lower or upper secondary education, and 3.7% had completed secondary or higher education.

Table 1. Sample Distribution According to Sociodemographic and Clinical Characteristics (N = 27)

Variable	n (%)
Sex	
Female	9 (33.3%)
Male	18 (66.7%)
Age (years)	
72-75	2 (7.4%)
76-80	4 (14.8%)
81-85	3 (11.1%)
86-90	10 (37.0%)
91-95	5 (18.5%)
96-100	3 (11.1%)
Educational level	
Cannot read or write	1 (3.7%)
Can read and write, without formal education	6 (22.2%)
Primary Education	12 (44.4%)
Lower and Upper Secondary Education	6 (22.2%)
Secondary Education	1 (3.7%)
Higher Education	1 (3.7%)
Occupational category	
Manual and operational workers	16 (59.3%)
Cleaning and domestic services	4 (14.8%)
Commerce and business	4 (14.8%)
Construction and engineering professionals	1 (3.7%)
Administrative and financial services	2 (7.4%)
Marital status	
Single	2 (7.4%)
Married	4 (14.8%)
Widowed	21 (77.8%)
Diabetes type	
Type 1	3 (11.1%)
Type 2	24 (88.9%)

Characterization of Perceived Facilitators and Barriers to Exercise Among Institutionalized Older Adults with Diabetes

Quantitative perspective based on EBBS

Application of the Exercise Benefits and Barriers Scale (EBBS) yielded satisfactory internal consistency in the present sample (Cronbach's α = 0.749) and total scores ranging from 100 to 140 (M = 118.56; SD = 8.21). Most participants (55.5%) scored between 111 and 120, followed by 29.6% scoring between 121 and 130. Only 7.4% scored within the 100–110 and 131–140 ranges.

Regarding perceived benefits, participants expressed high agreement with statements such as: "Exercise improves my health condition" (92.6%), "It enhances psychological well-being" (92.6%), and "It improves the ability to perform daily activities" (96.3%). Additionally, perceived benefits included improvements in mental health (81.5%), muscle strength (85.2%), cardiovascular function (88.9%), and a

sense of personal accomplishment (85.2%). The belief that exercise contributes to longevity was reported by 70.4% of participants.

Concerning perceived barriers, 62.9% considered it difficult to remain physically active, 92.6% indicated that exercise requires excessive time, and 81.5% reported fatigue associated with exercising. Other barriers included cost (55.5%), limited encouragement from others (40.7%), lack of appropriate facilities (48.1%), and facility distance (96.3%).

Table 2 presents the EBBS results, detailing the frequency of participants who agreed or strongly agreed with each item in the scale.

Table 2 . EBBS Results

Item	n (%)
I enjoy exercise.	19 (70.3%)
Exercise decreases feelings of stress and tension for me.	16 (59.2%)
Exercise improves my mental health.	22 (81.5%)
Exercising takes too much of my time.	25 (92.6%)
I will prevent heart attacks by exercising.	20 (74.1%)
Exercise tires me.	18 (66.6%)
Exercise increases my muscle strength.	23 (85.2%)
Exercise gives me a sense of personal accomplishment.	23 (85.2%)
Places for me to exercise are too far away.	26 (96.3%)
Exercising makes me feel relaxed.	19 (70.4%)
Exercising lets me have contact with friends and persons I enjoy.	24 (88.9%)
I am too embarrassed to exercise.	1 (3.7%)
Exercising will keep me from having high blood pressure.	20 (74.1%)
It costs too much to exercise.	15 (55.5%)
Exercising increases my level of physical fitness.	25 (92.6%)
Exercise facilities do not have convenient schedules for me.	3 (11.1%)
My muscle tone is improved with exercise.	24 (88.9%)
Exercising improves functioning of my cardiovascular system.	24 (88.9%)
I am fatigued by exercise.	22 (81.5%)
I have improved feelings of well being from exercise.	25 (92.6%)
My spouse (or significant other) does not encourage exercising.	11 (40.7%)
Exercise increases my stamina.	21 (77.8%)
Exercise improves my flexibility.	27 (100%)
Exercise takes too much time from family relationships.	2 (7.4%)
My disposition is improved with exercise.	23 (85.2%)
Exercising helps me sleep better at night.	20 (74.1%)
I will live longer if I exercise.	19 (70.4%)
I think people in exercise clothes look funny.	2 (7.4%)
Exercise helps me decrease fatigue.	18 (66.7%)
Exercising is a good way for me to meet new people.	25 (92.6%)
My physical endurance is improved by exercising.	26 (96.3%)
Exercising improves my self-concept.	22 (81.5%)
My family members do not encourage me to exercise.	4 (14.8%)
Exercising increases my mental alertness.	23 (85.2%)
Exercise allows me to carry out normal activities without becoming tired.	26 (96.3%)
Exercise improves the quality of my work.	8 (29.6%)
Exercise takes too much time from my family responsibilities.	26 (96.3%)
Exercise is good entertainment for me.	13 (48.1%)
Exercising increases my acceptance by others.	20 (74.1%)
Exercise is hard work for me.	17 (62.9%)
Exercise improves overall body functioning for me.	26 (96.3%)
There are too few places for me to exercise.	13 (48.1%)
Exercise improves the way my body looks.	27 (100%)

Note. EBBS = Exercise Benefits/Barriers Scale. Values are presented as n (%).

Qualitative Perspective through Semi-Structured Focus Group Interviews

The qualitative analysis resulted in four main themes. The first theme, “Perceived Impact of Diabetes,” reflects how institutionalized older adults interpret the consequences of the diagnosis on their health, autonomy, and daily functioning.

1. Impact of the diabetes diagnosis on institutionalized older adults

The impact of the diabetes diagnosis emerged as the first theme from the qualitative analysis, reflecting changes in participants’ health perceptions and their sense of resilience and stability.

Perception of health after the diagnosis

Many participants (n = 10) reported a decline in their perceived health following the diagnosis. As illustrated by P28: "Since then, I feel less healthy."

Feelings of resilience and stability

Conversely, several participants (n = 15) reported maintaining resilience and stability following the diagnosis. As P23 stated: "We don't like it, but it hasn't affected anything."

Adherence to treatment strategies

Twelve participants (n = 20) described actively managing their diabetes through glycemic control and consistent medication use. For example, P19 noted: "My diabetes is under control; I prick my finger," while P27 added: "Now I always pay attention; I take the right medication." These statements highlight participants' proactive engagement in disease management.

Changes in dietary habits

Most participants (n = 18) reported modifying their dietary habits after the diagnosis, primarily by reducing sugary food intake. For example, P14 stated: "I had to control my diet more, cut down on sweets, I replaced sugar with honey," and P27 added: "It changed a lot, I had to stop eating sweets.". These dietary adjustments were consistently reported across participants.

Health professionals

Within diabetes management, the family doctor was the most frequently consulted health professional (n = 17). P25 explained: "I go to the family doctor and she tells me what to do. She explains what I should and shouldn't eat.".

Concerns related to the diagnosis

A few participants (n=3) reported concerns regarding their diabetes, particularly fluctuations in glycemic levels. P13 stated: "I worry it might get worse. It's something that concerns me. Some days it's high, other days it's low, and I get worried," while P9 added: "I'm always anxious. I'm more concerned about my health now."

Loss of autonomy and independence

Five participants reported a loss of autonomy and independence, mainly due to walking difficulties. P20 commented: "I have trouble walking and I think it might be related," while P21 stated: "I started walking worse, having more falls.".

Professional and family impact

Some participants (n = 4) mentioned the influence of family and friends in diabetes management, considering these factors important in their experience with the disease. Regarding professional life, only two participants reported changes, such as P9: "I used to work in a restaurant and I couldn't taste the food anymore.".

2. Exercise Habits in Institutionalized Older Adults with Diabetes

The second theme identified in the qualitative analysis concerned participants' exercise habits before institutionalization and their current routines within the institutions.

Thirteen participants reported that professional activity constituted their primary form of exercise before institutionalization, while only eight engaged in formal exercise, such as walking, football, or gym workouts. For instance, P1 stated: "I exercised a lot while working," and P25 added: "Work was the exercise we did."

Regarding current exercise routines, all participants reported that the institutions offered weekly group gymnastics sessions lasting 45 to 60 minutes, primarily performed while seated. P3 explained: "We all do gymnastics together in the room, in the afternoon, on Wednesdays," and P9 noted: "On average, it lasts 45 minutes."

Additionally, the majority participants (n = 22) reported regular participation in walking, gymnastics, or judo classes; however, only one institution provided hydrogymnastics.

3. Perceived Barriers to Exercise in Institutionalized Older Adults with Diabetes

The third emerging theme concerns the perceived barriers to physical exercise.

Exercise Determinants

The most frequently reported barriers were categorized under exercise determinants. The three most common barriers were pain (n = 9), physical limitations (n = 6), and fatigue (n = 6). Participants illustrated these challenges as follows: P19 stated: "It's hard to move, the body feels stiff," P9 noted: "I feel fatigued when I exercise," and P20 explained: "It's difficult to exercise because it starts to hurt.".

Additionally, one participant reported insufficient exercise frequency, and two participants noted the lack of individualized exercise programs.

Regarding the physical environment, weather also limited participation, as P23 explained: "I don't go because it's cold."

4. Perceived Facilitators of Exercise in Institutionalized Older Adults with Diabetes

The fourth theme identified concerned facilitators of exercise. The most frequently reported facilitators were positive feelings associated with exercise, social support, and perceived improvements in mobility.

Positive Feelings Associated with Exercise

Most participants (n=19) described exercise as eliciting positive feelings, including enhanced well-being, increased energy, improved mood, better health perception, and recognition of exercise benefits. P17 stated: "Exercise makes us feel healthier," P4 noted: "Exercise gives me more energy and vitality," and P14 added: "Exercise is important; it makes us feel good.".

Social Support

Fourteen participants (n=14) identified social support from professionals and peers as a key motivator for exercise. P23 stated: "Exercising with others is more fun," P19 noted: "I like doing it with someone so I don't feel so alone," and participant 9 added: "I feel more confident exercising with someone."

Improved Mobility

Some participants (n=11) reported improvements in mobility as a benefit of regular exercise. P19 explained: "It helps us move better. It's good for gaining movement."

Muscle Performance

Three participants reported improvements in muscle performance resulting from exercise. P17 stated: "It's good for the muscles.".

Exercise Frequency and Variety

Two participants emphasized the importance of exercise frequency, and one participant highlighted the variety of exercises as a motivating factor for adherence.

Health Professional Recommendations

Two participants reported that recommendations from health professionals facilitated engagement in exercise, reinforcing its perceived relevance for overall health.

The Table 3 below presents the absolute and relative frequencies of the identified subthemes, expressed as the number of participants who mentioned each subtheme. These frequencies are provided for descriptive purposes only, to enhance transparency in the presentation of the qualitative findings, while preserving the interpretive nature of the thematic analysis.

Table 3. Absolute and Relative Frequencies of the Identified Subthemes Across Participants (N = 27)

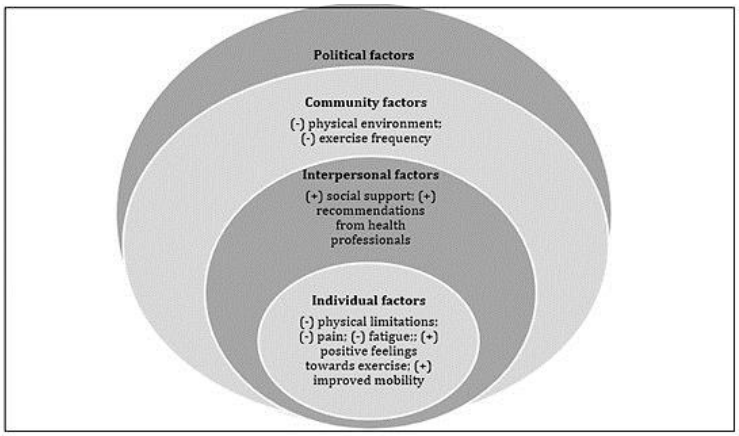
Theme	Subtheme	n (%)
Impact of diabetes diagnosis	Feelings of resilience and post-diagnosis stability	15 (55.6%)
	Changes in the perception of health and well-being	10 (37.0%)
	Adherence to treatment strategies	12 (44.4%)
	Changes in eating habits	18 (66.7%)
	Recommendations from healthcare professionals	17 (62.9%)
	Emotional and psychological impact	3 (11.1%)
	Family history and close social contacts	4 (14.8%)
	Impact on autonomy and Independence	6 (22.2%)

	Professional impact	2 (7.4%)
Physical exercise habits	Previous exercise routines	21 (77.8%)
	Current type of exercise practiced	22 (81.5%)
Barriers to exercise	Negative determinants of exercise	25 (92.6%)
	Feelings of insecurity	3 (11.1%)
	Lack of knowledge	2 (7.4%)
Facilitators of exercise	Material and professional resources	3 (11.1%)
	Positive perceptions of exercise	3 (11.1%)
	Positive feelings associated with exercise	27 (100.0%)
	Social support	15 (55.6%)
	Muscle performance	3 (11.1%)
	Mobility	12 (44.4%)
	Pain relief	2 (7.4%)
	Physical appearance	2 (7.4%)

Note. Frequencies represent the number of participants who expressed each subtheme. Percentages are based on the total sample (N = 27).

The main barriers and facilitators to exercise identified in the focus groups are summarized in Figure 1, organized according to the socioecological model. At the individual level, physical limitations, pain, and fatigue were reported as barriers, while positive feelings toward exercise and improved mobility served as facilitators. Less frequently mentioned factors included perceived improvements in physical appearance and muscle performance. At the interpersonal level, social support and recommendations from health professionals were recognized as key facilitators. At the community level, limited or inadequate exercise spaces and restricted access were identified as barriers, along with low participation frequency. No political factors were reported in this study. The main categories of barriers and facilitators identified in the focus groups are presented in **¡Error! No se encuentra el origen de la referencia.**, organized according to the socioecological model.

Figure 1. Summary of the Main Categories of Barriers and Facilitators to Exercise Identified through Focus Groups, organized According to the Socioecological Model



Legend: (-) identified barriers; (+) identified facilitators.

Discussion

Characterization of Perceived Facilitators and Barriers to Exercise Among Institutionalized Older Adults – A Qualitative and Quantitative Perspective

This study achieved its primary aim by identifying the barriers and facilitators to exercise participation among institutionalized older adults with diabetes and examining the perceived challenges associated with diabetes care management. Through a mixed-methods approach, integrating EBBS results with

qualitative insights from focus groups, it was possible to capture how individual, interpersonal, and environmental factors influence exercise behaviors in this population. Overall, although participants recognized clear physical, psychological, and functional benefits of exercise, they also faced several constraints—such as pain, fatigue, physical limitations, limited social support, and environmental barriers within institutions—that hinder regular participation. Conversely, positive emotional experiences, perceived improvements in mobility, and meaningful social interactions emerged as key facilitators, highlighting the multidimensional and dual nature of exercise engagement in this context.

To further contextualize these findings, the quantitative results from the EBBS were examined to explore participants' perceptions of exercise-related benefits and barriers, followed by a qualitative analysis that provided greater depth and explanation for these patterns.

From a quantitative perspective, the EBBS revealed a mean score of 118.56 (± 8.21), indicating an overall positive perception of exercise. This value is consistent with, and even exceeds, findings from previous studies with individuals with diabetes (99.79 ± 12.58) (Ersin et al. 2022). Within the socioecological framework, individual-level determinants emerged prominently: 62.9% of participants reported difficulties performing exercise, 81.5% experienced fatigue during or after exercising, and 92.6% perceived exercise as time-consuming.

The qualitative analysis, based on semi-structured focus group interviews, reinforced and expanded these results by identifying pain (n = 9), physical limitations (n = 6), and fatigue (n = 6) as the primary barriers to exercise participation. These findings are consistent with the literature, particularly Schutzer & Graves (2004), who identified pain and medical conditions as major deterrents to exercise (Schutzer & Graves, 2004). Likewise, Che et al. (2022) reported that older adults frequently describe pain, fatigue, and physical discomfort as key barriers to maintaining regular exercise routines (Che et al., 2022). Another barrier that emerged in the present study was low motivation and lack of enjoyment, echoing previous work demonstrating the importance of psychological and motivational factors in exercise adherence among older adults (Che et al., 2022).

At the interpersonal level, 40.7% of participants reported a lack of encouragement from family members and close contacts in the EBBS, suggesting that insufficient social support may undermine motivation to engage in exercise. The literature reinforces this interpretation: Che et al. (2022) identified family and peer support as key determinants of motivation and adherence to exercise among older adults (Che et al., 2022). This alignment between quantitative and qualitative evidence highlights the central role of social relationships in promoting sustained engagement in exercise, even within institutional settings.

Beyond individual determinants, the findings also revealed important interpersonal and community-level factors influencing exercise participation, consistent with the socioecological model. At the community and environmental level, more than half of the participants (55.5%) perceived the cost of exercise as a significant barrier, and an overwhelming majority (96.3%) reported inadequate or inaccessible exercise facilities. These findings underscore the importance of structural and environmental conditions in enabling exercise among institutionalized older adults. Similar patterns are reported in the literature: Schutzer & Graves (2004) identified environmental constraints—such as lack of appropriate spaces, resources, or infrastructure—as major barriers to exercise adherence in older adults (Schutzer & Graves, 2004). Che et al. (2022) likewise noted that unfavorable environmental conditions, including climate, limited space, and inadequate material resources, significantly hinder engagement in exercise (Che et al., 2022).

In addition to the barriers identified, several facilitators emerged at the individual and interpersonal levels, illustrating factors that support and motivate older adults with diabetes to engage in exercise. Interestingly, although the EBBS identified lack of social support as a barrier, the qualitative analysis highlighted social support as one of the strongest facilitators of exercise participation. This apparent contrast underscores the complexity of interpersonal influences: while insufficient support can discourage engagement, the presence of meaningful social interaction strongly motivates participation. These findings are consistent with previous research showing that social support enhances motivation, adherence, and long-term engagement in exercise. Che et al. (2022) reported that social interaction is a key enabler of regular exercise among individuals with diabetes, and a systematic review by Smith et al. (2017) concluded that support from peers, family members, and healthcare professionals significantly increases adherence to exercise programs (Che et al. ,2022; Lindsay Smith et al., 2017). In this context,

the social dimension of exercise should be explicitly considered when designing interventions for institutionalized older adults with diabetes. Group-based activities, opportunities for shared movement experiences, and initiatives that involve family members or peers may enhance exercise adherence and perceived enjoyment.

No facilitators emerged at the community or policy levels in the present study. This absence may be attributable to limitations in the interview guide, restricted support networks among institutionalized adults, and the institutional environment itself, where broader community and policy influences may be less visible to residents. These findings highlight the importance of future research examining how environmental, community, and policy-level factors shape exercise participation in institutionalized settings, as such determinants may be critical for sustaining long-term exercise engagement.

Challenges Perceived by Institutionalized Older Adults in Managing Diabetes Care

Participants identified medication, glycemic control, and dietary changes as their primary diabetes management strategies, consistent with previous evidence (Vilafranca Cartagena et al., 2021). Notably, none of the participants mentioned exercise as part of diabetes management, revealing a limited understanding of the role of exercise in glycemic control. This gap in knowledge—also highlighted in prior research (Che et al., 2022; Ersin et al., 2022) —represents an important barrier to behavior change. Several participants further equated past professional activity with structured exercise, reinforcing this misconception. Indeed, the lack of knowledge about the relationship between exercise and health emerged as a key barrier in this older population. Awareness of the benefits of exercise is a fundamental prerequisite for behavior change, and its absence may limit engagement in exercise programs, particularly in institutionalized settings where structured guidance and educational support are often restricted (Che et al., 2022; Ersin et al., 2022). This finding highlights the need for targeted educational interventions within institutional care settings that emphasize the role of exercise in diabetes management and overall health. By improving residents' understanding of how exercise affects glycemic control and functional capacity, such interventions could increase motivation, enhance adherence to exercise programs, and ultimately contribute to better health outcomes.

Within the participating institutions, exercise opportunities were mostly limited to weekly seated group gymnastics sessions and walking. Although inclusive, these programs may not address individual needs. Similar limitations, including low frequency, reduced variety, and large group sizes, have been reported previously (Poveda-López et al., 2023). These findings support the need for personalized and varied exercise programs delivered in smaller groups and supervised by trained professionals.

Environmental barriers also emerged, particularly the inadequacy of available exercise spaces. This aligns with prior studies showing that accessibility and the physical environment influence exercise participation (Schutzer & Graves, 2004; Poveda-López et al., 2023). Enhancing institutional infrastructures—such as creating dedicated indoor corridors, outdoor exercise areas, or partnerships with community sports facilities—may help address this gap.

Healthcare professionals were perceived as central to diabetes management, especially general practitioners, who were trusted sources of advice regarding both medication and lifestyle modifications. This is consistent with Che et al. (2022), who emphasized the importance of professional support in promoting exercise among older adults with diabetes (Che et al., 2022). Collaborative, individualized exercise prescriptions may therefore help increase adherence.

Insufficient encouragement from family members also represented a challenge. As highlighted in the literature, social support is a critical determinant of both the initiation and maintenance of exercise (Che et al., 2022). Involving family and peers in exercise programs may thus strengthen motivation and adherence in institutionalized older adults.

Finally, financial constraints were identified as a barrier, reinforcing findings from previous studies (Che et al., 2022). This emphasizes the need for public policies that reduce economic barriers and expand access to exercise opportunities. Importantly, the identification of financial and environmental barriers was facilitated by the mixed-methods design, highlighting the added value of integrating qualitative and quantitative approaches.

In addition to individual and program-related challenges, the institutional context itself poses further obstacles to exercise participation among residents. The institutional context plays a central role in

exercise participation among institutionalized older adults. Structured daily routines, such as fixed times for meals and activities, can both facilitate and limit participation depending on how exercise opportunities are organized. Limitations in physical space, accessibility, and the availability of equipment, as well as dependence on supervised programs, directly influence residents' engagement. The presence or absence of staff to guide and motivate activities can also affect the frequency and quality of participation. These factors demonstrate that individual barriers and facilitators, such as motivation or fatigue, interact with the institutional environment, highlighting the importance of considering organizational context when designing interventions to promote physical exercise in this population.

Study Limitations

This study has several limitations that should be considered when interpreting the findings. First, the small, geographically constrained convenience sample limits the generalizability of the results to broader populations of institutionalized older adults with diabetes. The exclusive inclusion of residents able to complete the instruments and participate in focus groups may also have introduced selection bias, as individuals with greater cognitive, functional, or mobility impairments—who often face the most substantial barriers to exercise —were not represented. Second, the study included only institutional settings, without perspectives from community-dwelling older adults, which restricts contextual diversity. Additionally, although thematic saturation was approached progressively, a greater number of focus groups could have enhanced analytical depth and reinforced the validity of the emergent themes. Finally, the reliance on self-reported data may have introduced recall or social desirability bias. These limitations highlight the need for future studies using larger and more diverse samples, including individuals with higher levels of dependency, and employing multiple data sources to strengthen methodological rigor. Additionally, the possibility of social desirability bias in online focus groups should be considered, as participants may have moderated their responses to align with socially acceptable norms, particularly regarding health behaviors.

Conclusions

This study highlights that institutionalized older adults with diabetes face a complex combination of individual, interpersonal, and environmental barriers that limit their engagement in physical exercise, despite clearly recognizing its physical, functional, and psychosocial benefits. A key challenge identified was the limited recognition of exercise as an integral component of diabetes management. Enhancing knowledge about the role of physical exercise in glycemic control and overall health is therefore essential to support behavior change and improve adherence.

The findings reinforce the need for tailored exercise programs that account for the most prominent barriers—such as pain, fatigue, and functional limitations—while simultaneously integrating key facilitators, particularly social support and opportunities for meaningful interaction. Interventions should be delivered by qualified professionals, incorporate health education, and actively involve family members and peers, thereby strengthening motivation and promoting sustained participation.

Future research should include larger and more diverse samples, explore the influence of institutional environments in greater depth, and examine the impact of personalized exercise programs on clinical outcomes and quality of life. Together, these efforts may contribute to more effective, accessible, and patient-centered exercise interventions for older adults living with diabetes.

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