

Comprehensive Program for Stimulation, Rehabilitation, and Inclusion for Senior Citizens in the Milagro Canton

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HOW TO CITE:

Karina Vargas Castro, Narcisa Bravo Alvarado, Lázaro Adrián García Lebroc, Zaida Lorena Orozco Moreno, (2026). Comprehensive Program for Stimulation, Rehabilitation, and Inclusion for Senior Citizens in the Milagro Canton. International Journal of Special Education, 41(25s), 18 - 31

ABSTRACT:

Population ageing has increased the demand for community-based interventions that promote functional independence, healthy lifestyles, and social participation among older adults. This study aimed to describe the implementation and outcomes of a multidisciplinary community intervention designed to promote healthy ageing through therapeutic rehabilitation, cognitive stimulation, nutritional education, and social inclusion activities in Milagro Canton, Ecuador. A descriptive community intervention was conducted between April 2024 and April 2026 involving 96 community-dwelling older adults and 149 undergraduate students from Psychology, Physiotherapy, Nutrition and Dietetics, Education, and Basic Education programs. Institutional records and program monitoring reports were analyzed to characterize the intervention and its outcomes. The program comprised 192 intervention sessions distributed across therapeutic rehabilitation, cognitive stimulation, nutritional education, and recreational activities. Improvements in functional performance were observed in 78.1% of participants, while 72.9% demonstrated enhanced cognitive engagement. Nutritional workshops increased healthy eating awareness in 83.3% of beneficiaries, and 84.4% maintained high participation in social inclusion activities throughout the intervention. The interdisciplinary university–community model also promoted active student participation and strengthened experiential learning. These findings suggest that multidisciplinary community-based interventions represent a feasible strategy for promoting healthy ageing by integrating physical, cognitive, nutritional, and social components while simultaneously reinforcing university engagement and community health promotion.

Keywords: healthy ageing; community intervention; older adults

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1. Introduction

Population ageing has become one of the most significant demographic transformations of the twenty-first century, profoundly reshaping

healthcare systems, social policies, and community services worldwide. According to the World Health Organization (WHO, 2021), the global increase in life expectancy and the

declining fertility rates have resulted in a rapidly expanding older adult population, requiring health systems to move beyond disease-centered care toward approaches that preserve functional ability, autonomy, and social participation. Consequently, healthy ageing is now recognized as a multidimensional process that encompasses physical, cognitive, psychological, and social well-being rather than merely the absence of disease (WHO, 2021). This paradigm shift has encouraged governments, healthcare providers, and academic institutions to implement comprehensive interventions aimed at maintaining independence and improving quality of life among community-dwelling older adults.

Current evidence consistently demonstrates that multidomain interventions are more effective than isolated strategies in addressing the complex health needs associated with ageing. Community-based programs integrating physical rehabilitation, cognitive stimulation, nutritional education, and social engagement have shown favorable outcomes in preserving functional capacity and delaying the onset of frailty and disability. In a systematic review, Kim et al. (2022) reported that multicomponent interventions significantly improved daily functioning and independence among community-dwelling older adults, emphasizing the importance of combining different therapeutic components rather than implementing single-focus interventions. Likewise, Crocker et al. (2024) and Neil et al. (2022) concluded that complex community-based interventions contribute to maintaining independence, reducing functional decline, and enhancing overall health outcomes among older populations.

Among the different components of multidimensional interventions, therapeutic exercise has consistently been identified as one of the most effective strategies for promoting healthy ageing. Exercise programs focused on strength training, balance, flexibility, gait retraining, and functional mobility have demonstrated significant improvements in muscle performance, physical function, and fall prevention. Furthermore, an umbrella review evaluating community-based physical activity and nutritional interventions highlighted that structured exercise programs positively influence

mobility, physical performance, and functional independence while reducing disability risk among older adults. Similarly, Yang et al. (2024) demonstrated through a systematic review and meta-analysis that multicomponent exercise interventions improve physical function, cognitive performance, and frailty status, reinforcing the value of integrated rehabilitation programs delivered within community settings.

Cognitive health represents another essential dimension of healthy ageing. Although cognitive decline is frequently associated with advancing age, growing evidence indicates that structured cognitive stimulation may preserve executive functions, attention, memory, and processing speed. Zhong et al. (2026) and Mollaei et al. (2022) found that cognitive training interventions significantly improved global cognitive performance while simultaneously reducing depressive symptoms among older adults. These findings support the incorporation of activities such as memory exercises, orientation tasks, problem-solving sessions, language stimulation, and executive function training into comprehensive rehabilitation programs. Rather than functioning as isolated interventions, cognitive stimulation activities appear to produce greater benefits when integrated with physical exercise and opportunities for social interaction.

Nutrition also plays a fundamental role in maintaining functional ability throughout the ageing process. Physiological changes associated with ageing increase the risk of malnutrition, sarcopenia, frailty, and chronic diseases, making nutritional education an essential component of preventive care. Comprehensive programs that promote balanced diets, adequate protein intake, hydration, and healthy eating behaviors have demonstrated positive effects on physical performance and quality of life. Consequently, nutritional counselling has increasingly been incorporated into multidisciplinary community interventions, contributing to healthier lifestyles and supporting long-term functional independence.

Beyond physical and biological dimensions, social participation has emerged as a critical determinant of healthy ageing. Older adults experiencing social isolation are more likely to develop functional limitations, depressive

symptoms, reduced quality of life, and increased dependence. Therefore, promoting meaningful participation within the community has become an essential objective of contemporary ageing policies. Tcymbal et al. (2022) demonstrated that interventions simultaneously promoting physical activity and social participation generated greater health benefits than interventions addressing either domain independently. Likewise, the WHO (2021b) identified ageism and social exclusion as significant barriers to healthy ageing, emphasizing the need to create inclusive environments that facilitate active participation in community life. Recreational, educational, cultural, and intergenerational activities therefore represent valuable strategies for strengthening social networks while reinforcing both physical and cognitive functioning.

Recent research has increasingly emphasized the importance of multidisciplinary rehabilitation models capable of integrating healthcare, education, nutrition, and community engagement. Cesari et al. (2022) argued that frailty management should no longer focus exclusively on disease treatment but instead adopt comprehensive, person-centered approaches addressing multiple determinants of health simultaneously. Similarly, Mollaei et al. (2025) concluded that community-based multidisciplinary rehabilitation programs significantly improve mobility, functional independence, and overall quality of life among older adults, particularly when interventions are delivered through coordinated interdisciplinary teams. These findings reinforce the growing consensus that comprehensive rehabilitation should combine therapeutic exercise, cognitive stimulation, nutritional guidance, and opportunities for social inclusion within a single intervention framework.

Despite the substantial evidence supporting multidomain interventions, important gaps remain in the implementation and evaluation of community-based programs in Latin America. Most published studies have been conducted in high-income countries, whereas evidence describing interdisciplinary university–community partnerships remains limited. Higher education institutions possess considerable potential to contribute to healthy ageing

initiatives by integrating teaching, community engagement, and service-learning activities that simultaneously benefit students and vulnerable populations. Nevertheless, reports documenting these collaborative experiences, particularly those involving multidisciplinary student participation in comprehensive rehabilitation programs, remain scarce in the regional literature.

To address this gap, the Comprehensive Program for Stimulation, Rehabilitation, and Inclusion for Senior Citizens in the Milagro Canton was developed as an interdisciplinary community engagement initiative involving 149 undergraduate students from Psychology, Physiotherapy, Nutrition and Dietetics, Education, and Basic Education programs. Under academic supervision and in collaboration with local institutions, the program implemented coordinated activities including therapeutic exercise sessions, cognitive stimulation workshops, nutritional education, and recreational and social integration activities designed to promote functional capacity, active participation, and healthy ageing among community-dwelling older adults. This multidisciplinary approach also provided students with experiential learning opportunities while strengthening university–community collaboration.

Therefore, the present study aimed to describe the implementation of a comprehensive community-based stimulation, rehabilitation, and social inclusion program for older adults in Milagro Canton and to analyze its contribution as an interdisciplinary strategy for promoting healthy ageing through university engagement. Overall, the findings suggest that integrating physical rehabilitation, cognitive stimulation, nutritional education, and community participation within a coordinated multidisciplinary framework represents a feasible and valuable approach for enhancing older adults' well-being while simultaneously strengthening the practical training of future healthcare and education professionals.

2. Methodology

• Study design

This study employed a community-based intervention design aimed at promoting healthy

ageing through the implementation of a multidisciplinary stimulation, rehabilitation, and social inclusion program for community-dwelling older adults in Milagro Canton, Ecuador. The intervention was developed within the university's community engagement framework, integrating academic training with health promotion and social responsibility initiatives. The study adopted a practice-oriented approach focused on describing the implementation of an interdisciplinary intervention designed to enhance older adults' functional capacity, encourage active participation, and foster social inclusion through coordinated community activities.

• Study setting and participants

The community intervention was conducted between April 2024 and April 2026 in Milagro Canton, Ecuador, through collaborative agreements established between the participating university and local community institutions, including Unidad Educativa San José and the Milagro Chamber of Commerce. These institutions facilitated participant recruitment, logistical organization, and the implementation of community-based activities.

The target population consisted of community-dwelling older adults who voluntarily participated in the comprehensive intervention program. Beneficiaries were identified through institutional and community networks and participated in activities designed to promote healthy ageing, functional independence, and social inclusion.

The intervention was implemented by 149 undergraduate students enrolled in Psychology, Physiotherapy, Nutrition and Dietetics, Education, and Basic Education programs. Most students were attending the sixth, seventh, or

eighth academic semesters and participated under faculty supervision as part of the university's mandatory community engagement program. The interdisciplinary composition of the student team enabled the integration of complementary professional perspectives addressing physical rehabilitation, cognitive stimulation, nutritional education, and social participation.

Beneficiary population

A total of 96 community-dwelling older adults participated in the intervention program. Two additional institutional records corresponded to community organizations rather than individual beneficiaries and were excluded from the participant characterization. The beneficiaries were distributed across the intervention components implemented by different academic programs. Women represented the majority of participants ($n = 61$; 63.5%), while men accounted for 35 participants (36.5%). Participants ranged in age from 60 to 89 years, with a mean age of 71.8 ± 7.4 years.

Most participants presented at least one chronic health condition associated with ageing, including hypertension, osteoarthritis, type 2 diabetes mellitus, or reduced functional mobility, although these conditions were not considered exclusion criteria because the intervention activities were individually adapted according to participants' physical capacities.

The intervention was implemented by 149 undergraduate students, distributed among Psychology ($n = 42$), Education ($n = 53$), Physiotherapy ($n = 15$), Nutrition and Dietetics ($n = 21$), and Basic Education ($n = 18$), under faculty supervision throughout the implementation period (April 2024–April 2026).

Table 1. General characteristics of the study participants

Variable	n	%
Older adults	96	100.0
Female	61	63.5
Male	35	36.5
Age (years), mean $\pm$ SD	71.8 ± 7.4	—
Age range	60–89	—
Student intervention providers	149	100.0
Education	53	35.6

Variable	n	%
Psychology	42	28.2
Nutrition and Dietetics	21	14.1
Basic Education	18	12.1
Physiotherapy	15	10.1

• Description of the community intervention

The Comprehensive Program for Stimulation, Rehabilitation, and Inclusion for Senior Citizens was designed as a multidimensional intervention addressing multiple determinants of healthy ageing. Activities were organized into four complementary intervention components.

The first component focused on therapeutic physical rehabilitation, consisting of supervised sessions aimed at improving functional mobility, muscular strength, balance, joint flexibility, postural control, gait performance, and coordination. Low-impact therapeutic exercises, stretching routines, balance training, functional mobility exercises, and group movement activities were adapted to participants' functional abilities to encourage safe participation while promoting independence in daily living activities.

The second component addressed cognitive stimulation, incorporating structured activities intended to preserve cognitive performance and stimulate executive functioning. Sessions included memory exercises, temporal and spatial orientation activities, attention and concentration tasks, language-based activities, logical reasoning exercises, problem-solving activities, and group cognitive games designed to stimulate mental engagement and encourage social interaction among participants.

The third intervention component consisted of nutritional education, which sought to promote healthy eating habits and increase awareness regarding nutrition during ageing. Educational workshops addressed balanced diets, adequate hydration, protein intake, healthy food selection, chronic disease prevention through nutrition, food safety practices, and practical recommendations for maintaining adequate nutritional status in later life.

Finally, the program incorporated social inclusion and recreational activities designed to strengthen interpersonal relationships, encourage community participation, and reduce social isolation. Participants engaged in recreational games, group dynamics, cultural activities, intergenerational encounters, collaborative workshops, music-based activities, and community integration sessions that promoted communication, emotional well-being, and active participation within supportive social environments.

Each intervention component was implemented using participatory methodologies that emphasized active engagement, collaborative learning, and individualized support according to participants' functional capacities. Faculty members supervised all activities to ensure methodological consistency, participant safety, and appropriate implementation of the intervention.

• Data collection

Data describing the implementation of the intervention were extracted from the official institutional documentation generated during the execution of the community engagement project. These records included beneficiary registration forms, attendance lists, intervention reports, institutional monitoring documents, and administrative databases compiled between April 2024 and April 2026.

Before analysis, all records underwent a document review process to verify completeness and consistency. Duplicate records were identified and removed when appropriate, while incomplete administrative information (e.g., missing identification documents, contact information, or demographic variables) was documented but did not affect the implementation of the intervention itself. Only anonymized information relevant to the

objectives of the present study was retained for analysis to ensure participant confidentiality.

• Data analysis

A descriptive analytical approach was employed to summarize the characteristics of the intervention and its implementation. Institutional records were reviewed to identify the main components of the multidisciplinary program, the academic disciplines involved, participating institutions, and the activities developed throughout the intervention. Descriptive statistics were used to summarize participant characteristics and program implementation whenever quantitative information was available, whereas qualitative descriptions were used to characterize the intervention process and interdisciplinary collaboration.

3. Results

• Characteristics of the participants

The community intervention was carried out with the participation of 96 community-dwelling older adults who voluntarily enrolled in the Comprehensive Program for Stimulation, Rehabilitation, and Inclusion implemented in Milagro Canton, Ecuador. The beneficiary population was predominantly female, with 61 women (63.5%) and 35 men (36.5%). Participants ranged in age from 60 to 89 years, with a mean

age of 71.8 ± 7.4 years, reflecting a heterogeneous group with different functional and social needs commonly associated with the ageing process.

Although the intervention was open to all eligible older adults residing in the participating communities, institutional records indicated that most beneficiaries presented age-related conditions such as reduced mobility, mild balance impairment, chronic musculoskeletal discomfort, hypertension, or type 2 diabetes mellitus. These conditions did not limit participation, as all intervention activities were adapted according to each participant's physical capabilities and functional status.

The intervention was delivered by an interdisciplinary team composed of 149 undergraduate students from five academic programs. Education students represented the largest proportion of the intervention team (35.6%), followed by Psychology (28.2%), Nutrition and Dietetics (14.1%), Basic Education (12.1%), and Physiotherapy (10.1%). Students from different disciplines worked collaboratively throughout the intervention period under continuous academic supervision, allowing the implementation of complementary activities addressing physical rehabilitation, cognitive stimulation, nutritional education, and community participation.

Table 2. General characteristics of the study participants.

Variable	n	%
Older adults	96	100.0
Female	61	63.5
Male	35	36.5
Mean age (years $\pm$ SD)	71.8 ± 7.4	—
Age range	60–89	—
Student intervention providers	149	100.0
Education	53	35.6
Psychology	42	28.2
Nutrition and Dietetics	21	14.1
Basic Education	18	12.1
Physiotherapy	15	10.1

• Implementation of the community intervention

The intervention was implemented between April 2024 and April 2026 in collaboration with local institutions, including Unidad Educativa San José

and the Milagro Chamber of Commerce. Activities were organized according to a multidisciplinary work plan that combined therapeutic rehabilitation, cognitive stimulation, nutritional education, and social inclusion initiatives. The intervention was delivered through coordinated group sessions supervised by faculty members, allowing students from different academic programs to participate jointly in planning, execution, and follow-up activities.

During the implementation period, a total of 192 intervention sessions were conducted.

Table 3. Distribution of intervention activities.

Intervention component	Sessions %	
Therapeutic rehabilitation	68	35.4
Cognitive stimulation	52	27.1
Recreational and social inclusion activities	40	20.8
Nutritional education	32	16.7
Total	192	100.0

Attendance remained consistently high throughout program implementation. Based on attendance records, the overall participation rate reached 89.6%, with most beneficiaries attending at least four out of every five scheduled sessions. Participation was particularly stable during therapeutic rehabilitation and recreational activities, whereas occasional absences during nutritional workshops were primarily associated with temporary health conditions or personal commitments rather than program-related factors.

The interdisciplinary organization of the intervention facilitated coordinated participation among the different academic programs. Physiotherapy students primarily led mobility and balance exercises; Nutrition and Dietetics students conducted educational workshops on healthy eating and hydration; Psychology students collaborated in cognitive stimulation activities; and Education and Basic Education students coordinated recreational, educational, and community integration sessions. This collaborative model promoted continuity between intervention components while ensuring that older adults received comprehensive support addressing physical, cognitive, educational, and social dimensions of healthy ageing.

Therapeutic rehabilitation represented the largest proportion of scheduled activities (35.4%), reflecting the importance of maintaining functional mobility and physical independence among participants. Cognitive stimulation sessions accounted for 27.1% of the intervention, while recreational and social inclusion activities represented 20.8%. Nutritional education workshops comprised the remaining 16.7%, focusing on promoting healthy dietary practices and preventing nutrition-related health risks.

Overall, institutional monitoring records confirmed that all planned intervention components were completed according to the established schedule, with no major interruptions affecting program implementation. The high attendance rates and continuous participation observed throughout the

• Functional and cognitive outcomes

The multidisciplinary intervention produced favorable changes in participants' functional performance and cognitive engagement throughout the implementation period. According to the monitoring records completed by the supervising faculty and student teams, most older adults demonstrated progressive improvements in their ability to perform the therapeutic and cognitive activities included in the program.

Regarding physical performance, 75 participants (78.1%) showed improvements in at least one functional domain, including balance, gait stability, lower-limb strength, flexibility, or coordination. These improvements were evidenced by increased confidence during therapeutic exercises, greater independence in functional mobility tasks, and enhanced participation in group activities. Seventeen

participants (17.7%) maintained stable functional performance during the intervention, while four participants (4.2%) experienced temporary reductions in performance associated with acute health conditions unrelated to the intervention, such as respiratory infections or exacerbation of chronic musculoskeletal disorders.

Cognitive stimulation sessions also yielded positive outcomes. Routine observational assessments conducted during memory, attention, orientation, and problem-solving activities indicated that 70 participants (72.9%)

demonstrated greater cognitive engagement by the end of the intervention. Improvements were primarily reflected in increased participation during group discussions, better performance in memory-based exercises, improved temporal orientation, and greater ability to complete sequential cognitive tasks. Cognitive performance remained stable in 23 participants (24.0%), whereas only three participants (3.1%) exhibited slight declines, mainly attributable to age-related cognitive deterioration documented before enrollment.

Table 4. Functional and cognitive outcomes following the intervention.

Outcome	Improved n (%)	Stable n (%)	Declined n (%)
Functional performance	75 (78.1)	17 (17.7)	4 (4.2)
Cognitive engagement	70 (72.9)	23 (24.0)	3 (3.1)

Further analysis of functional performance showed that balance exercises and gait training achieved the highest levels of participant adherence, with most beneficiaries progressively completing activities requiring dynamic balance and coordinated movements with less assistance than at the beginning of the intervention. Likewise, flexibility and joint mobility exercises were well tolerated across different age groups, allowing participants with varying functional capacities to engage safely in the rehabilitation sessions.

Similarly, cognitive stimulation activities involving orientation, memory recall, word association, numerical reasoning, and collaborative problem-solving maintained high levels of participation throughout the program. As the intervention progressed, facilitators observed greater interaction among participants during group exercises, with many older adults demonstrating increased confidence when completing cognitive tasks individually or collaboratively. Overall, these findings suggest that combining physical rehabilitation with structured cognitive stimulation contributed to maintaining active participation and functional engagement during the intervention period.

• Nutritional education outcomes

Nutritional education constituted an essential component of the multidisciplinary intervention

and was delivered through 32 educational workshops designed to promote healthy dietary practices among community-dwelling older adults. The educational sessions addressed topics including balanced nutrition, adequate hydration, healthy meal planning, protein consumption, prevention of malnutrition, management of chronic diseases through diet, food safety, and appropriate portion sizes for older populations.

Participation in the nutritional workshops remained consistently high, with an average attendance rate of 86.5% across all scheduled sessions. Educational activities combined short presentations with practical discussions, allowing participants to share personal experiences regarding eating habits, food preparation, and nutritional challenges associated with ageing.

Post-intervention educational assessments indicated that 80 participants (83.3%) demonstrated improved knowledge regarding healthy nutrition and the relationship between dietary habits and healthy ageing. In addition, 73 participants (76.0%) reported incorporating at least one healthier dietary practice into their daily routine during the intervention period. The most frequently reported behavioral changes included increased daily water intake, greater consumption of fruits and vegetables, reduction of foods with excessive salt and sugar, and improved awareness of balanced meal composition.

Table 5. Outcomes associated with nutritional education.

Indicator	n	%
Improved nutritional knowledge	80	83.3
Adoption of healthier eating habits	73	76.0
Maintained previous healthy practices	19	19.8
No observable changes reported	4	4.2

Educational records further indicated that participants showed greater interest in preventive nutrition topics directly related to chronic disease management, particularly hypertension, diabetes mellitus, and osteoporosis. Practical demonstrations involving food selection, meal distribution throughout the day, and healthy hydration strategies generated the highest levels of interaction during workshop sessions.

Although the primary objective of the nutritional component was educational rather than therapeutic, the findings suggest that the workshops successfully increased participants' awareness of healthy dietary practices and encouraged gradual behavioral changes compatible with healthy ageing. These outcomes complement the physical rehabilitation and cognitive stimulation components, reinforcing the multidisciplinary nature of the intervention and its emphasis on promoting functional well-being through coordinated community-based strategies.

• Social participation and inclusion

One of the principal objectives of the intervention was to promote active social participation and reduce the risk of social isolation among community-dwelling older adults. To achieve this, the program incorporated structured recreational, educational, and community integration activities designed to encourage interpersonal interaction, collaborative participation, and active engagement in group settings. These activities complemented the therapeutic and educational components of the intervention by fostering supportive social

environments where participants could strengthen interpersonal relationships while maintaining regular participation in community life.

Throughout the implementation period, 40 recreational and social inclusion sessions were conducted, representing 20.8% of the total intervention activities. Sessions included group recreational games, music and movement activities, memory competitions, cultural celebrations, collaborative workshops, intergenerational encounters, and educational dynamics designed to encourage communication, teamwork, and emotional well-being.

Attendance records demonstrated a consistently high level of participation in these activities. Overall, 81 participants (84.4%) attended at least 80% of the scheduled social inclusion sessions, while 11 participants (11.5%) maintained moderate participation. Only four participants (4.1%) attended fewer than half of the scheduled activities, primarily because of temporary health limitations or family-related commitments during the intervention period.

Institutional monitoring records further indicated progressive increases in participant interaction during group sessions. As the program advanced, facilitators observed greater willingness among participants to engage in collaborative activities, assume active roles during recreational exercises, and participate in group discussions. This progression contributed to maintaining continuity across intervention sessions and reinforced participants' motivation to remain actively involved in the program.

Table 6. Participation in social inclusion activities.

Indicator	n	%
High participation ($\geq 80\%$ attendance)	81	84.4
Moderate participation (50–79% attendance)	11	11.5

Low participation (<50% attendance)	4 4.1
Total participants	96 100.0

In addition to attendance, qualitative monitoring conducted by faculty supervisors indicated that participants gradually became more comfortable interacting with peers during collective activities. Older adults who initially demonstrated limited engagement increasingly participated in recreational exercises, educational games, and collaborative group dynamics, suggesting that the multidisciplinary intervention created a supportive environment that encouraged sustained community participation.

• Student participation and interdisciplinary collaboration

The implementation of the intervention also generated significant educational outcomes through the active participation of 149 undergraduate students from five academic programs. Throughout the project, students were directly involved in planning, organizing, implementing, and monitoring intervention activities under the supervision of faculty members, allowing them to apply theoretical knowledge in real community settings while strengthening interdisciplinary collaboration.

Each academic discipline contributed according to its professional competencies. Physiotherapy students led therapeutic exercise sessions focused on mobility, balance, flexibility, and functional rehabilitation. Nutrition and Dietetics students designed and delivered educational workshops promoting healthy dietary practices and nutritional awareness. Psychology students coordinated cognitive stimulation activities intended to strengthen memory, attention, orientation, and executive functioning, while Education and Basic Education students facilitated recreational, educational, and community integration activities that promoted active participation and social interaction.

Institutional monitoring records indicated a high level of student commitment throughout the intervention period. Of the 149 participating students, 136 (91.3%) successfully completed all scheduled community engagement activities, whereas 13 students (8.7%) required schedule adjustments because of academic commitments but completed the minimum institutional requirements established for the project.

Table 7. Student participation during program implementation.

Indicator	n	%
Completed all assigned activities	136	91.3
Completed minimum required activities	13	8.7
Withdrew from the project	0	0.0
Total students	149	100.0

Faculty supervision reports also highlighted the effectiveness of the interdisciplinary working model adopted throughout the intervention. Regular coordination meetings facilitated communication among the different academic programs, enabling the integration of rehabilitation, cognitive stimulation, nutrition, and educational strategies into a unified intervention plan. This collaborative approach minimized duplication of activities, improved continuity of care, and allowed intervention

sessions to address multiple dimensions of healthy ageing simultaneously.

Overall, the results demonstrate that the Comprehensive Program for Stimulation, Rehabilitation, and Inclusion was successfully implemented through coordinated collaboration between the university and community institutions. The high levels of beneficiary attendance, sustained participation across all intervention components, and strong engagement of undergraduate students support the operational feasibility of multidisciplinary

university–community partnerships as a strategy for promoting healthy ageing while simultaneously strengthening experiential learning in higher education.

4. Discussion

The present study described the implementation of a multidisciplinary community-based intervention aimed at promoting healthy ageing through the integration of therapeutic rehabilitation, cognitive stimulation, nutritional education, and social inclusion activities. Overall, the findings indicate that the program was successfully implemented within a university–community partnership model and achieved high levels of participation among both older adults and undergraduate students. The intervention was characterized by sustained attendance, favorable functional and cognitive outcomes, increased awareness of healthy nutritional practices, and active engagement in social participation activities, suggesting that multidimensional interventions can provide comprehensive support for community-dwelling older adults.

One of the principal findings of this study was the positive evolution observed in participants' functional performance following the implementation of therapeutic rehabilitation activities. Most beneficiaries demonstrated improvements in mobility, balance, flexibility, and functional independence, while only a small proportion maintained stable performance or experienced temporary limitations associated with pre-existing health conditions. These findings are consistent with recent evidence indicating that multicomponent exercise interventions constitute one of the most effective approaches for preserving functional capacity during ageing. In particular, the umbrella review on community-based physical activity and nutritional interventions emphasized that structured exercise programs contribute to improving mobility, reducing functional decline, and maintaining independence among older adults. Similarly, Yang et al. (2024) concluded that exercise programs integrating strength, balance, and functional training produce significant benefits in physical performance while simultaneously reducing frailty risk. The improvements observed in the present

intervention reinforce these conclusions and demonstrate that similar strategies can be successfully implemented through university-led community engagement initiatives.

The favorable cognitive outcomes identified in this study further support the growing body of evidence advocating multidomain interventions for healthy ageing. Most participants demonstrated greater engagement during cognitive stimulation sessions, with observable improvements in memory-related activities, attention, orientation, and participation in structured cognitive exercises. Although the present study was not designed to quantify changes through standardized neuropsychological instruments, the progressive improvement documented during routine monitoring is consistent with the systematic review conducted by Zhong et al. (2026), who reported that structured cognitive training contributes to maintaining cognitive performance while promoting psychological well-being among older adults. The integration of cognitive stimulation with physical rehabilitation may have enhanced participant motivation and facilitated sustained engagement throughout the intervention, supporting the concept that cognitive and physical health should be addressed simultaneously rather than independently.

Nutrition represented another essential component of the intervention. Educational workshops promoted healthier eating habits and increased participants' awareness regarding hydration, balanced diets, and disease prevention through nutrition. Although the primary objective of these sessions was educational rather than clinical, most participants reported adopting healthier dietary behaviors during the implementation period. These findings agree with previous studies demonstrating that nutritional education complements physical rehabilitation by encouraging lifestyle modifications that contribute to functional preservation and chronic disease prevention. Likewise, the umbrella review of community-based interventions highlighted that combining physical activity with nutritional strategies produces broader benefits than implementing isolated interventions, particularly among community-dwelling older adults with multiple health risks.

An equally relevant finding concerns the social dimension of healthy ageing. High attendance rates during recreational and community integration activities indicate that older adults accepted the intervention and maintained active participation throughout the project. Institutional monitoring suggested progressive increases in interaction among participants during collaborative activities, reinforcing the importance of structured opportunities for social engagement. These observations are closely aligned with the systematic review by Tcymbal et al. (2022), which demonstrated that interventions simultaneously promoting physical activity and social participation achieve greater overall benefits than interventions focusing exclusively on one dimension. From a broader perspective, these findings also support the recommendations established by the World Health Organization during the Decade of Healthy Ageing, which recognizes social participation, community inclusion, and the reduction of social isolation as fundamental determinants of healthy ageing (WHO, 2021).

Beyond the outcomes observed among older adults, this study also highlights the educational value of multidisciplinary community engagement initiatives within higher education. The participation of 149 undergraduate students from different academic disciplines facilitated the implementation of an integrated intervention while simultaneously providing opportunities for experiential learning in real community contexts. This collaborative model enabled students to apply disciplinary knowledge, strengthen communication skills, and develop competencies related to teamwork and community service. These findings reinforce the growing recognition that universities can play a central role in promoting population health while preparing future professionals capable of addressing the complex and multidimensional needs associated with population ageing.

The interdisciplinary structure of the intervention deserves particular attention. Rather than implementing isolated activities delivered independently by each academic program, the project adopted a coordinated strategy in which physiotherapy, psychology, nutrition, and education complemented one another within a

unified intervention framework. This organizational model is consistent with the person-centered perspective proposed by Cesari et al. (2022), who argue that frailty management should move beyond disease-specific approaches toward integrated strategies addressing multiple determinants of health simultaneously. Likewise, the successful implementation of the present program supports the conclusions of Kim et al. (2022), whose systematic review emphasized that multicomponent interventions are generally more effective than single-component approaches in maintaining daily functioning and promoting independence among community-dwelling older adults.

From a public health perspective, the findings also demonstrate the potential contribution of university–community partnerships to local healthy ageing policies. Many low- and middle-income countries continue to experience limited access to multidisciplinary community services for older adults, particularly outside specialized healthcare settings. In this context, university extension and community engagement programs represent valuable mechanisms for expanding preventive health services while simultaneously strengthening academic training. The experience developed in Milagro Canton illustrates how higher education institutions can complement existing community resources by integrating education, health promotion, rehabilitation, and social participation into a coordinated intervention model with relatively modest institutional resources.

Despite these encouraging findings, several limitations should be acknowledged. First, the study adopted a descriptive community intervention design without a control group, limiting the ability to establish causal relationships between the intervention and the observed outcomes. Second, outcome assessment relied primarily on institutional monitoring records rather than standardized clinical instruments, preventing more precise quantification of changes in physical function, cognition, nutritional status, or quality of life. Third, the study was conducted within a single community context, which may limit the generalizability of the findings to other geographical regions or healthcare systems.

Finally, some administrative records contained incomplete demographic information; however, these documentation gaps did not interfere with the implementation of the intervention or the characterization of its principal components.

Future research should incorporate longitudinal and controlled study designs capable of evaluating the long-term effectiveness of multidisciplinary community interventions using validated outcome measures. Future studies may also explore the sustainability of behavioral changes following program completion, examine cost-effectiveness, and investigate the specific contribution of each intervention component to overall functional outcomes. Additionally, expanding similar university–community partnership models to other regions would contribute to strengthening the evidence base supporting interdisciplinary approaches to healthy ageing in Latin America.

Overall, the present findings reinforce the growing international evidence supporting comprehensive community-based interventions for older adults. The integration of therapeutic rehabilitation, cognitive stimulation, nutritional education, and social participation within an interdisciplinary university–community framework proved operationally feasible and was associated with favorable functional, educational, and social outcomes. These results support the adoption of collaborative models that simultaneously promote healthy ageing, strengthen community engagement, and enhance the practical education of future health and education professionals.

5. Conclusion

- The multidisciplinary community-based intervention was successfully implemented through a university–community partnership, achieving sustained participation of older adults and the involvement of 149 undergraduate students from different academic disciplines.

6. References

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- Participants showed favorable changes in functional performance, particularly in mobility, balance, flexibility, and functional independence, following participation in therapeutic rehabilitation activities.
- Cognitive stimulation activities were associated with progressive improvements in engagement in memory, attention, orientation, and structured cognitive tasks, although these changes were not quantified using standardized neuropsychological instruments.
- Nutritional education increased participants' awareness of healthy eating, hydration, balanced diets, and nutrition-related disease prevention, with most participants reporting healthier dietary practices during the intervention.
- Recreational and community integration activities promoted sustained social participation and interaction among older adults, highlighting the relevance of social engagement as a component of healthy ageing.
- The interdisciplinary model integrating rehabilitation, cognitive stimulation, nutrition, and social participation was operationally feasible and provided a comprehensive approach to supporting healthy ageing in a community setting.
- The participation of undergraduate students provided opportunities for experiential learning, interdisciplinary collaboration, communication, teamwork, and community engagement, demonstrating the educational value of university–community interventions.
- The findings should be interpreted cautiously because the descriptive design, absence of a control group, use of institutional monitoring records, and single-community setting limit causal inference and generalizability.
- Future research should employ controlled longitudinal designs and validated instruments to quantify changes in physical, cognitive, nutritional, and psychosocial outcomes and to assess the long-term sustainability and cost-effectiveness of multidisciplinary community interventions.

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7. Acknowledgements (Optional)

This research received no external funding.

8. Author Declaration

The authors declare no conflict of interest.