

Intergenerational Collaborative Pathways for Language-Based Rehabilitation: Synergistic Effects of Family-Community Linkage on Language Ability and Social Participation in Older Adults with Mild Cognitive Impairment

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Abstract:

Based on the bio-psycho-social framework, this study constructs and analyzes a path model of language-based rehabilitation's effect on language ability and social participation in older adults with Mild Cognitive Impairment (MCI). Language-based rehabilitation is divided into three dimensions: structured language training, pragmatic and narrative competence development, and language-related psychosocial support. The study examines the mechanisms through which it influences social participation via mediating variables such as communication confidence, self-efficacy, and social role identity, and identifies key moderating factors such as family support, community resources, digital literacy, and institutional supply. It proposes a service quality monitoring system integrating quantitative and qualitative assessments, a community-led modular practice pathway, and a tiered promotion strategy for sustainable operation. The study emphasizes the influence of contextualized intervention and cultural adaptation on pathway effects and suggests future use of longitudinal and contextualized randomized designs to verify causal robustness and long-term outcome transformation effects, providing a theoretical and practical basis for the institutionalization of language-based rehabilitation in public health and elderly care policies.

Keywords:

Language-Based Rehabilitation, Mild Cognitive Impairment, Social Participation, Path Model, Communication Confidence, Community Intervention

1. Introduction

The aging trend of the population is becoming increasingly severe, with a growing number of older adults, whose cognitive functions gradually decline with age. Mild

cognitive impairment (MCI) has become a central issue affecting the social participation and quality of life of older adults [1]. Language ability is not only an important component of the cognitive system but also a vital tool for maintaining social relationships, fulfilling social roles, and realizing self-worth. Therefore, examining the “language rehabilitation” practice for people with MCI from a sociological perspective is of great value for understanding the interaction mechanism between cognitive decline and social isolation, constructing targeted intervention frameworks, and optimizing support systems at the community and family levels.

Language rehabilitation is proposed as a comprehensive concept covering language ability maintenance, pragmatic training, communication environment optimization, and related psychological support measures. Placing language rehabilitation within a bio-psycho-social model can better reveal its potential influence path on the cognitive trajectory of older adults: language activities enhance semantic retrieval, narrative organization, and pragmatic adaptation, thereby improving individual communication efficiency in social interactions; improved communication effectiveness further affects subjective self-efficacy and social willingness, thereby promoting the increase of social participation behaviors; the expansion of social participation generates positive feedback in terms of emotional support, cognitive stimulation, and role reconstruction, forming a virtuous cycle that promotes cognitive stability and social integration [2].

This article systematically reviews the internal mechanisms of language rehabilitation affecting language ability and social participation in older adults with MCI, and strives to provide a more operable framework in terms of concept definition, variable system, and theoretical integration. In terms of concept definition, language rehabilitation is subdivided into structural language ability training, pragmatic and narrative ability development, and language-related psychosocial support, in order to clarify mediating variables and measurement indicators in subsequent path analysis. The construction of the variable system attempts to place language ability and social participation in a dynamic interactive relationship, emphasizing the impact of mediating variables and moderating variables on path strength. It is hoped that this study can arouse people’s attention to the psychosocial status of older adults with MCI and provide a scientific basis for carrying out psychosocial interventions in the future.

2. Path Model Construction and Mechanism Analysis

2.1. Composition and Operational Dimensions of Language-Based Well-being

Structural Language Training: Training or activities targeting vocabulary retrieval, naming ability, syntactic processing, and speech fluency. Measurement indicators include naming task scores, verbal fluency (both semantic and letter categories), and accuracy in syntactic comprehension tasks.

Pragmatic and Narrative Competence Development: Emphasizes training in conversational strategies, repair strategies, topic maintenance, and narrative coherence, such as situational dialogue exercises, narrative retelling, and story generation activities. Measurement indicators include narrative coherence scores, frequency of repair strategy use, and dialogue duration indicators.

Language-Related Psychosocial Support: Enhancing communication confidence and social role identity through social interaction design, role-playing,

intergenerational activities, and family communication skills training. Measurement indicators include the Communication Self-Efficacy Scale, subjective social satisfaction, and role identity scales.

Each dimension can be implemented independently in practice or combined into a comprehensive language-based well-being program. The model assumes that these dimensions have differential effects on different aspects of language ability and are linked to social participation outcomes through psychosocial variables.

2.2. Analysis of Main Mediating Mechanisms

The model design identifies several key mediating mechanisms that connect changes in language ability with social participation behaviors, forming the core links of the path.

Communication Confidence and Self-Efficacy: Improved language ability has a direct impact on subjective communication confidence. Enhanced vocabulary retrieval ability and narrative organization ability reduce feelings of communication failure and communication load, increasing the willingness and initiative to participate in social activities. Self-efficacy affects the decision-making process at the motivational level: when deciding whether to participate in an activity, individuals weigh their options based on their assessment of their own communication skills. Therefore, self-efficacy serves as both a bridge for cognitive assessment and a catalyst for behavior initiation in the path.

Social Role Identity and Sense of Belonging: Effective communication promotes the ability to assume roles in groups, thereby enhancing the sense of social identity. The restoration or improvement of narrative ability enables individuals to better participate in group communication and story sharing, thereby obtaining social feedback and recognition. This social feedback reinforces participation behavior in reverse, forming a social dynamic mechanism for sustained participation. The reconstruction of role identity has a sustaining effect on long-term participation and plays a steady-state effect in individual psychological adaptation.

Interaction Quality: In addition to the frequency of interaction, the path emphasizes that quality, i.e., the effectiveness, emotional depth, and supportive feedback of communication, is critical to psychological and behavioral outcomes. Improved pragmatic competence often directly enhances interaction quality, thereby influencing emotional health and social participation sustainability through emotional support pathways.

2.3. Moderating Factors and Contextual Variables

The model identifies several moderating variables that affect the strength and direction of the path from language rehabilitation to language ability and social participation, reflecting the context-dependent and heterogeneous nature of the path.

(1) Individual-Level Moderating Variables

Education and Occupational Background: Higher levels of education and complex work experience are typically associated with richer vocabulary reserves and stronger metacognitive strategies. Language rehabilitation interventions may show structural language ability improvements more quickly in such individuals, whereas pragmatic training and contextualized support may be more beneficial in individuals with lower educational backgrounds.

Health and Cognitive Baseline Status: Comorbid chronic diseases, hearing loss, or significant executive function decline can reduce the efficiency of translating language training into social behavior. Conversely, individuals with greater cognitive reserve are more likely to achieve functional improvements through language practice.

Digital Literacy: As digital communication platforms become increasingly important in older adults' social participation, the ability to use digital tools becomes a critical moderating factor in the path, affecting the feasibility of remote interaction and online narrative activities in language rehabilitation.

(2) Family and Community-Level Moderating Variables

Family Support and Interaction Patterns: Family members' communication attitudes, frequency of companionship, and active participation in language rehabilitation activities directly affect an individual's opportunities and persistence in practice. When a supportive communication culture exists within the family, the training effects are more likely to be externalized into actual social behavior.

Accessibility of Community Resources: The types of community activities, the supply of professionals, and the availability of public spaces determine the implementation and scalability of language rehabilitation programs. Individuals with strong community embeddedness have more opportunities to translate improvements in language ability into actual social participation.

Cultural Norms and Social Expectations: Culture's expectations for the roles of older adults influence their behavioral choices. In cultural environments that emphasize respect for the elderly and intergenerational interaction, role reconstruction facilitated by language rehabilitation is more easily recognized by society, thereby enhancing motivation to participate.

(3) Institutional and Policy-Level Moderating Variables

Pension Policies and Service Systems: Incorporating language rehabilitation into routine community health and elderly care service programs directly affects the financial support, personnel training, and long-term sustainability of the programs. In contexts with strong policy support, the amplification effect of the path is more evident.

Technology and Infrastructure Support: Broadband coverage, elderly-friendly ICT (Information and Communication Technology) platforms, and digital training resources are important intermediary conditions for the realization of remote language rehabilitation and online social participation.

3. Practical Pathways

3.1. Guiding Principles for Policy Design

In light of the macro-level language aging mechanisms and micro-level expectation erosion mechanisms of the MCI elderly population, China should draw on advanced experiences from home and abroad to introduce specific policies for language rehabilitation and well-being for elderly individuals with MCI. Regarding inter-departmental coordination, the integration of language rehabilitation and well-being into public health and community elderly care policies should rely on verifiable path models and measurement indicators, establishing a coordination mechanism among health, civil affairs, education, and community service departments. Relevant policies

should clarify the definition, service standards, and performance evaluation indicators for language rehabilitation and well-being, avoiding the simple categorization of language rehabilitation and well-being as rehabilitation medicine or a single social service, thereby achieving the coordinated allocation of resources and continuous investment. In terms of fairness and accessibility, policy design should address accessibility issues arising from urban-rural differences, socioeconomic status, and the digital divide. Incentive subsidies and mechanisms for professional talent to work in underserved areas should be established for remote and resource-scarce regions; face-to-face and family-supported language rehabilitation and well-being services should be prioritized for elderly populations with low education levels and low digital literacy. Regarding community service models, the leading role of front-line community organizations in the language rehabilitation and well-being system should be strengthened through policy support to promote capacity building, professional training, and diversified service provision at the community level. The community serves both as a service provider and assumes the responsibilities of monitoring intervention effectiveness and long-term maintenance.

3.2. Community and Institutional Approaches

Given the scarcity of institutions specializing in language rehabilitation and wellness for older adults with MCI, governments should increase investment in professional language rehabilitation institutions, improving both their hardware and software configurations. On one hand, modular language rehabilitation service packages can be developed, designing modular intervention packages catering to different ability levels. These packages should cover four main modules: structured training, pragmatic and narrative activities, family communication guidance, and digital communication training. Each module should include an instruction manual, activity templates, assessment tools, and training PPTs to facilitate standardized implementation at the community level and customized combinations based on individual needs. Modular design facilitates scaled promotion and outcome evaluation [3,4]. On the other hand, interdisciplinary team building and capacity enhancement should be conducted, promoting the formation of stable collaboration mechanisms among speech-language pathologists, community nurses, social workers, psychologists, and volunteers. Shared assessment tools and intervention plan templates need to be established within the team, and regular case discussions and continuing education should be conducted. Encouragement should be given to incorporating simple language rehabilitation techniques into community nursing and social work professional training to expand service coverage. Simultaneously, in response to the weak family support system for language rehabilitation of older adults with MCI, full attention should be paid to enhancing the family's rehabilitation capacity. Regarding family involvement, communication strategy courses for family caregivers can be actively developed. Content should include contextualized communication skills, narrative co-creation methods, dialogue repair techniques, and active listening training. The family is the primary practice setting for language rehabilitation, and its participation significantly affects the transfer effect and sustainability of the intervention. In terms of the adaptation and promotion of digital tools, simplified communication tools and online narrative platforms for older adults can be developed, featuring large fonts, simple interfaces, and voice assistance functions. The platform should support group discussions, story sharing, and video calls, and embed practice tasks and feedback mechanisms. Face-to-face or family

tutoring should be provided for people with low digital literacy to reduce the negative impact of technical barriers on participation [5].

3.3. Service Quality Monitoring and Evaluation System

Establish a multi-dimensional evaluation indicator system: Construct an evaluation framework covering input, process, and outcome. Input indicators include the ratio of professional staff, financial investment, and accessibility of physical resources; process indicators include the frequency of activities, breadth of participation, and family participation rate; outcome indicators cover language ability, psychological mediating variables, and social participation indicators. The evaluation system should simultaneously incorporate short-term effects (3–6 months) and mid- to long-term outcomes (1–3 years) to capture the temporal characteristics of language ability improvement transforming into social participation and cognitive maintenance.

Assessment methods combining quantitative and qualitative approaches: A mixed-methods assessment strategy is recommended. The quantitative component should focus on using standardized measurement tools and structural equation models to test pre-set paths, while the qualitative component should supplement the micro-level understanding of interaction quality and social role changes through in-depth interviews, participant observation, and interactive audio/video analysis. Incorporating narrative analysis into the evaluation can reveal details of narrative complexity, the use of repair strategies, and social feedback patterns, which helps explain the relationships between quantitative indicators.

Establish a data-driven adaptive feedback mechanism: Communities or institutions should build a routine data collection and analysis process, using evaluation results as the basis for service design adjustments. Key Performance Indicators (KPIs) should be developed, such as the overall language function score improvement rate, the increase in participants' self-efficacy, and the long-term participation maintenance rate. Through periodic data review, identify low-performing groups and implement targeted intensive interventions or resource reallocation.

3.4. Scalable Promotion Strategies and Sustainable Operation Models

Given the current narrow coverage and lack of systematic approach in community-based language rehabilitation services, it is necessary to actively mobilize enthusiasm for community language rehabilitation, enhance the scientific planning of community language rehabilitation, and expand the service scope of community language rehabilitation.

Tiered Implementation and Pilot Promotion Path: In situations with limited policies and resources, a “demonstration-expansion-normalization” promotion strategy can be adopted. Priority should be given to carrying out demonstration projects in towns with better community service capabilities and professional talent resources. Replicable implementation manuals and cost-benefit analyses should be formed through rigorous evaluations. On the basis of demonstration, the project should be promoted to more communities, and modular adjustments should be made according to local characteristics. After normalization, language rehabilitation should be incorporated into the regular content of community health and elderly care services.

Financial and Incentive Mechanism Design: Explore multi-channel funding guarantee paths, including government financial investment, partial coverage of medical insurance or long-term care insurance, social capital participation, and

charitable donations. Establish performance subsidy or results-based payment mechanisms for communities and service providers to incentivize continuous improvement and interdisciplinary collaboration. At the same time, provide appropriate subsidies and career development channels for volunteers and grassroots workers.

Talent Training and Career Development Path: In view of the lack of institutions for language rehabilitation for elderly people with MCI, the government should increase investment in professional language rehabilitation institutions, establish a continuing education system that intersects speech rehabilitation and community work, and carry out modular training courses through universities, vocational training institutions, and online platforms. Encourage professionals to deepen their long-term investment in the field of community language rehabilitation through certification and career advancement mechanisms. Promote the establishment of language rehabilitation supervision and case libraries to realize experience accumulation and knowledge dissemination.

4. Conclusions

This study integrates the bio-psychosocial framework to construct a multi-dimensional language rehabilitation and wellness intervention model. The core components are structured language training, pragmatic narrative ability development, and psychosocial support. The model demonstrates that improved language skills enhance social participation through psychosocial mediation, with interaction quality and resources moderating the intervention's effectiveness. The assessment system emphasizes a combination of quantitative and qualitative methods, proposing data-driven adaptive feedback and standardized processes. Policy recommendations focus on community-led modular services, interdisciplinary teams, family involvement, and digital strategies, advocating for tiered pilot programs and diversified financing. The study acknowledges cultural contextual differences and suggests future research employ longitudinal designs and contextualized interventions. Overall, language rehabilitation and wellness is a comprehensive service that promotes social inclusion and life dignity for older adults.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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