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Language Rehabilitation for Children with Hearing Impairment: A School–Home–Hospital–Community Collaborative Model

Xinxin Shan, Shihong Jiang *

Foreign Languages and Literature, University of South China, Hengyang, Hunan, China
*** Corresponding author:** Shihong Jiang (Email: susie0231@sina.com)

Abstract: Early childhood hearing loss limits incidental language learning and can influence later academic and social outcomes. This article reviews current service models and policy initiatives in China, synthesizes converging evidence on effective language-rehabilitation practices, and advances a child-centered School–Home–Hospital–Community model. The framework positions special-education teachers, parents/caregivers, and SLPs/audiologists as co-producers of daily language input and progress monitoring, complemented by community programs. A shared digital platform supports goal setting, coaching, and data exchange so children encounter aligned objectives and strategies across settings. By distributing expertise and strengthening family capacity, the model increases the intensity, diversity, and interactivity of language experiences, aligns with policy directions integrating education and health services, and offers practical steps toward equitable, inclusive outcomes for preschool children with hearing impairment.

Keywords: Hearing-impairment Children; Language Rehabilitation; School–Home–Hospital–Community Model.

1. Introduction

Language development in early childhood is fundamental to cognition, literacy, and social-emotional growth. For children with hearing impairment, acquiring language is particularly challenging due to reduced auditory input, which limits incidental learning and everyday conversational practice. Without timely and well-coordinated intervention, many hearing-impaired children experience persistent delays in vocabulary, morphosyntax, and discourse, which can later impede academic achievement. A robust body of evidence indicates that early identification and intervention are associated with substantially better outcomes (Geers et al., 2019; Musselman et al., 1988; Yoshinaga-Itano et al., 1998).

In China, most preschool-aged children with hearing loss still attend segregated special schools rather than inclusive settings, and there is a critical shortage of qualified personnel to support their language intervention. In response, scholars and policymakers have called for simultaneous workforce development and cross-sector collaboration, enabling families and service providers to act as a coherent team around each child. Building on this call, the present article proposes a comprehensive School–Home–Hospital–Community collaborative model for preschool language rehabilitation that positions special-education teachers, parents and caregivers, and speech-language pathologists (SLPs) as co-producers of daily language input and progress monitoring. We synthesize current practices and micro-level strategies, situate them within China's policy direction, and articulate an implementable framework to increase the intensity, diversity, and interactivity of language experiences across the child's day. This approach accords with international best practices in special education and with national guidance encouraging integration across general and vocational education, medical rehabilitation, and information technology to improve service quality (Ministry of Education, 2022).

2. Challenges in China's Current Rehabilitation Services

Hearing-impaired children in China have historically been educated primarily in segregated schools, with relatively few enrolled in mainstream settings alongside hearing peers. Although inclusive education has been promoted in recent years, implementation remains uneven, leaving many children with limited opportunities to interact with hearing peers and to access the general education curriculum consistently. Segregated placements can constrain language exposure and social integration, particularly when special schools are distant from families or operated with restricted resources. By contrast, mainstream settings can offer richer language models and more naturalistic communication when *appropriate* supports are in place (e.g. assistive listening devices, itinerant or co-teaching support, teacher training). However, many mainstream schools are not yet fully equipped to accommodate hearing-impaired students, and shortages of itinerant personnel and support services persist. In regular preschools, limited preparation in special education can make it difficult for teachers to include a child with hearing loss without external expertise. Consequently, parents often default to special schools, reinforcing segregated patterns.

A fundamental constraint is the limited supply of certified speech-language therapy professionals. SLP remains a comparatively new profession in China's rehabilitation landscape. According to the Second National Sample Survey of Persons with Disabilities (2006), fewer than 1,200 certified SLPs were available nationwide to serve a population with substantial speech and hearing rehabilitation needs. The shortage extends beyond SLPs to specially trained special-education teachers for hearing loss, educational audiologists, and other support staff. Many practitioners enter from adjacent fields with short-term training rather than specialist graduate preparation, producing variability in expertise,

particularly in under-resourced regions. Relative to countries such as Japan, France, and Australia, China continues to show large gaps both in workforce size and in the depth and consistency of pre-service and in-service preparation (Chen, 2019).

A further challenge is fragmentation across service systems. In practice, families of hearing-impaired children often navigate multiple systems – hospital or rehabilitation services for diagnostics, amplification, and therapy; specialized kindergartens or resource rooms for instruction; and community programs for parent support – frequently with limited formal linkage across these nodes. This fragmentation can produce duplicated efforts in some areas and gaps in others, and it places a heavy coordination burden on parents. Policy documents in recent years have emphasized improving the quality of special education through greater integration with general and vocational education, and with medical rehabilitation and information technology. At the same time, national early-hearing-detection initiatives and broader rehabilitation investments have expanded access to hearing technology and pediatric audiology; yet uneven distribution of trained personnel and variable home–school–hospital communication remains common implementation challenges. Within schools, teachers may have limited preparation specific to hearing loss, and itinerant or consulting services are often insufficient to sustain consistent classroom strategy use. On the clinical side, SLPs and educational audiologists focus on diagnostics and guided practice but may lack structured mechanisms to transfer and track techniques into daily home and classroom routines. Families, meanwhile, are central to outcomes (Moeller, 2000) yet frequently receive piecemeal guidance.

3. Micro-level Practices for Language Intervention

Despite the challenges noted, research and practice have identified several effective strategies to facilitate language development in children with hearing impairment. These strategies span instructional methods, therapeutic techniques, and the use of technology. Implementing them in varied contexts has yielded positive outcomes and provides actionable lessons for a comprehensive intervention model.

3.1. Multisensory Teaching Strategies

Because children with hearing impairment have reduced access to auditory information, it is crucial to engage additional modalities such as vision, touch, and residual hearing with amplification to support language learning. Multisensory approaches integrate visual cues (e.g., lipreading, sign language or visual phonics, pictures, and print) and tactile/kinesthetic elements (e.g., vibratory feedback or manipulatives) alongside aided auditory input.

This approach contrasts with strictly unisensory, auditory-only training. Decades of research indicate that combining vision with hearing generally yields better learning and socialization outcomes than oral-only methods (Power & Hyde, 1997). In practice, teachers often pair listening with clear mouth-shape models, gestures, and illustrations, and they use tactile strategies such as guiding children to feel vocal-fold vibration to understand voicing. Auditory-visual training that couples listening practice (with hearing aids or cochlear implants) and speechreading has likewise been shown to improve listening skills and spoken-word recognition. The core principle is to exploit multiple, redundant channels so that linguistic input is maximally accessible – facilitating initial acquisition, strengthening recognition and recall, and reducing frustration by keeping communicative demands achievable.

3.2. Situational Teaching Strategies

Young children learn language most effectively in naturalistic contexts – through meaningful exchanges tied to daily life rather than decontextualized drills. Situational teaching creates concrete scenarios in which language is used, so that words and sentences map directly onto experience. Because children with hearing impairment may not readily acquire incidental language from the environment, deliberately engineering communicative situations is especially important. Typical formats include role-playing everyday activities, thematic play (e.g., “shopping,” “going to the park”), and leveraging the immediate classroom or home environment as a language-rich setting (jointly attending to objects, narrating ongoing actions, and inviting responses).

A teacher might, for example, stage a “birthday party” so that children practice event-relevant nouns and verbs (cake, candles, gifts; eat, play, sing) alongside simple social routines. Parents can mirror this approach at home by narrating routine activities (cooking, dressing), prompting turn-taking, and expanding on the child’s attempts. Contextual cues deepen comprehension while the inherently playful format sustains motivation. Consistent with early-childhood pedagogy, situational teaching is best embedded across school and home to provide repeated, meaningful practice “in context”.

3.3. Play Therapy

Play can be used as a medium of early learning. For children with hearing impairment, well-designed games can stimulate language while sustaining engagement and lowering stress. Methods use toys, board or barrier games, songs, rhythm/movement, and interactive tasks as vehicles for vocabulary, morphosyntax, and pragmatics. Evidence indicates that play therapy and play-based language interventions improve communication skills (Casby & McCormack, 1985; Lin & Bratton, 2015). In play, children often produce more vocalizations/signs than in formal drills, and adults can model and expand child utterances within a low-pressure context.

Effective techniques include dialogic picture-book reading with props (naming, describing, and enacting), pretend-play roles that demand relevant language (e.g., customer–shopkeeper), and music-movement activities. Music is particularly helpful: even when melodies are not fully audible, rhythm and vibration provide multisensory cues to prosody and timing (Aldridge, 1994; Bruscia, 1996). A recent study by Gao et al. (2022) combined Orff-style music with picture-book reading; children receiving this combined training showed improvements in attention, listening, and vocabulary relative to a comparison group. Within the collaborative model, teachers and SLPs coach parents to turn daily play into language opportunities (e.g., narrating block play, prompting turns outdoors), establishing a positive emotional climate that sustains motivation.

3.4. Use of Technology and Smart Tools

Advances in technology provide new avenues to support language rehabilitation. Beyond the foundational role of hearing aids and cochlear implants, computer-assisted and

interactive tools can supplement face-to-face intervention. Reviews describe promising applications: speech-training software with real-time visual feedback, language-learning apps with sign-supported or bimodal content, and auditory-training games that build sound discrimination in playful formats (Xiao & Lei, 2018; Zhao, 2023). More recently, tools leveraging artificial intelligence (AI) and virtual reality (VR) have emerged – for example, AI-based speech tutors that provide corrective feedback, and VR scenarios that create immersive, language-rich environment.

"Smart education" products designed with universal-design principles are increasingly accessible to children with hearing or speech challenges (Huang, 2022). Examples include AI-assisted captioning in classrooms and home platforms that integrate therapy activities with progress tracking. Such tools are not panaceas, but they can increase practice intensity, broaden coverage, and enable more individualized support, especially where specialist resources are unevenly distributed. Telepractice can extend expert guidance to families in rural areas and automate routine practice (e.g., daily listening exercises), allowing specialists to focus on complex goals. In our collaborative model, technology is a cross-cutting enabler that links school, home, hospital, and community. A shared, secure platform can store individualized learning goals, short how-to videos, and basic progress dashboards. Both professionals and parents need brief training to use it well.

Multiple micro-level strategies – multisensory cueing, contextualized and play-based learning, and judicious technology use – have converging evidence in supporting language growth in children with hearing impairment. These strategies are complementary and work best in combination (e.g., a play activity that is multisensory and app-supported). The collaborative model in Section 4 embeds these practices across settings so that children encounter aligned goals and cues throughout the day.

4. A Collaborative Model Involving School, Home, Hospital, and Community

To address system-level gaps while harnessing the effective strategies above, we propose a School–Home–Hospital–Community collaborative model for language rehabilitation. The model is child-centered and emphasizes partnership among key stakeholders: the school (special-education and/or inclusive classroom teachers), the home (parents or primary caregivers), the hospital/rehabilitation center (speech-language pathologists, audiologists, and physicians), and community services (early-intervention centers, disability organizations, and broader community programs).

4.1. School: Special-Education Teachers and the Classroom

The school is often the primary setting where systematic instruction takes place. In this model, "school" can refer to a specialized preschool for children with hearing impairment or an inclusive preschool/kindergarten where the child is mainstreamed with support. Special-education teachers develop and implement individualized education plans focusing on language, communication, and pre-academic skills. Core responsibilities include daily teaching using the strategies in Section 3 and ongoing progress monitoring. In the collaborative model, the teacher does not work in isolation – they routinely communicate with the SLP/therapist (e.g., sharing class targets and soliciting strategy suggestions) and with parents (e.g., via a communication book or app that notes weekly vocabulary and activities for home reinforcement).

If the child is in an inclusive classroom, the model calls for additional supports: for instance, a visiting teacher of the deaf who consults with the regular teacher, or a teaching assistant who can provide one-on-one help, ensuring the child has access to the curriculum. The school setting also handles peer education: teaching hearing classmates basic sign language or fingerspelling (if used) or about hearing devices, to foster an understanding and inclusive environment. Moreover, the school should serve as a central hub for team meetings: ideally, case conferences where teachers, parents, and therapists review the plan and progress.

4.2. Home: Parents and Caregivers

Parents and other primary caregivers are the constant in the child's life and play a pivotal role in language development. Research consistently shows that *high parental involvement is linked to better language outcomes* in children with hearing loss (Cleveland & Reese, 2005; Hoff, 2003; Moeller, 2000; Wang et al., 2005; Wang et al., 2017). In this model, parents are coached to act as effective language facilitators or "co-therapists". Key skills include how to create a language-rich environment at home, how to use parental language scaffolding techniques (exaggerating intonation, simplifying but not babying language, following the child's lead, and expanding on the child's attempts to communicate), and how to integrate listening and speaking practice into everyday routines (for example, during meals, baths, or playtime).

Parents also learn to manage hearing technology, for example, checking hearing aids or cochlear implants (CIs) daily or troubleshooting issues, and to implement home-based auditory training (e.g., attending to environmental sounds, discriminating contrasts, responding to voices). Consistency with school and therapy approaches is emphasized, whether auditory-verbal or bilingual (spoken and sign). To make this feasible, the model includes parent workshops, short instructional videos, and, where possible, a family support coach who provides hands-on guidance and emotional support.

4.3. Hospital: Therapy and Medical Services

The term "hospital" here denotes the medical and rehabilitative services, primarily SLPs, audiologists, and other therapists (occupational or physical therapists if needed) involved in the child's care. Early responsibilities include confirming the degree and type of hearing loss, fitting hearing devices, and establishing baseline communication profiles. Services cover medical interventions (e.g., CI surgery where indicated) and ongoing audiological management (e.g., mapping CI processors, treating otologic conditions). Therapeutically, SLPs deliver individualized or small-group speech and language intervention (auditory training, articulation, vocabulary, and syntax).

These sessions are aligned with classroom and home priorities; techniques are shared with teachers and parents for everyday use. SLPs also provide consultation and in-service training to educators and parent education sessions. For very young children, intervention may begin in hospital- or center-based programs and transition to school settings; joint planning meetings help maintain momentum. Telehealth can extend specialist input to under-served areas. Close

collaboration ensures the plan is scientifically sound and responsive to medical issues that may impede language progress.

4.4. Community: Local Community and Support Services

The community component encompasses various support systems outside the formal school or hospital. These include local hearing and speech rehabilitation centers, community-based early-intervention programs, nongovernmental organizations (NGOs) or charities focused on children with disabilities, as well as playgroups or daycare centers that might include the child. Community-based programs can provide services such as parent support groups, additional therapy sessions funded by local Disabled Persons' Federations, and preschool preparatory classes. In the collaborative model, these centers should work hand in hand with hospitals and schools by sharing progress data and preparing children for successful school integration.

Community resources also include sign-language classes and Deaf community events, which can be especially valuable for families choosing a bilingual approach or for children who may not achieve full access to spoken language even with devices. Meeting Deaf adults and peers can bolster a child's self-esteem and provide natural language models in sign. Additionally, the community offers opportunities to practice communication in real-world settings. For example, a community center might organize a "speech club" or interactive activities where children with hearing impairment engage with volunteers or other children, with appropriate accommodations. These experiences help generalize skills beyond the structured school environment.

The community role also involves public awareness and accessibility. This includes advocating for barrier-free communication environments such as interpreter availability at public events, visual alert systems, and captioning services, which collectively foster a more inclusive society. Under the model, community agencies and schools or hospitals coordinate through, for example, an inter-agency committee. They might use a shared referral system. If a family first contacts an NGO, that NGO links them to medical services and the school district; conversely, if the child is in school, the school can refer the family to community resources for extra help during holidays or for social support.

In essence, the community fills gaps that neither the school nor the clinic may cover, adding an extra layer of support and reinforcing that rehabilitation is a societal effort. This also aligns with the policy vision of integrating medical services, information technology, and education, for example through accessible digital libraries or community centers that lend hearing-assistive devices.

5. Conclusion

Language rehabilitation for hearing-impaired children is a multifaceted endeavor that cannot be accomplished by any single professional or setting working alone. A School–Home–Hospital–Community collaborative model offers a promising framework to marshal available resources and expertise in a concerted effort to support the child's language development. By integrating the strengths of special education (structured pedagogy and access to curriculum), the family (natural environment and lifelong commitment), medical rehabilitation (specialized diagnostic and therapeutic expertise), and community services (supplementary support and social inclusion), the model creates a support system around the child. This holistic approach addresses both the macro-level need for coordinated infrastructure and the micro-level need for evidence-based teaching strategies delivered consistently across contexts.

Implementing this model in China could significantly improve outcomes for the many children who are currently underserved. It directly addresses professional shortages and service segmentation by distributing responsibility across a broader team and equipping non-specialists, such as parents and regular teachers, with usable skills. In doing so, it aligns with national policy goals to merge medical and educational efforts and to leverage technology for innovation in special education. It also resonates with global trends in deaf education that emphasize early intervention, family involvement, and inclusive practices, while remaining sensitive to China's rapidly evolving educational and health systems.

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