Models of Care in Early Intervention for Children with Hearing Impairment

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Early intervention (EI) is vital in ensuring children and their families are provided with the necessary support to reach their maximum potential. These services are particularly important in children who are considered at risk for developmental delay as a lack of intervention may have negative consequences on development, school readiness, educational outcomes and vocational opportunities. This chapter deliberates on models of care and their link to early childhood intervention (ECI), with a specific focus on the principles of intervention for children with hearing impairment. A discussion of the different approaches to service delivery of EI is provided, paying careful attention to contextual factors that might influence the intervention process. Considerations around educational access for children with disability in sub-Saharan Africa are highlighted. Lastly, solutions and recommendations for EI for hearing impairment in the South African context are put forward.

ECI is aimed at supporting children who are considered to be at risk for, or who have been identified as having, a developmental delay or disability (World Health Organization [WHO], 2012). ECI programmes include specialised services such as medical and rehabilitation services, family-centred support (including training and counselling), social and psychological services, special education as well as service planning and coordination (WHO, 2012). These specialised services are guided by specific reasoning and may be provided at different sites or levels of service delivery that include health care clinics, hospitals, EI centres, rehabilitation centres, community centres, homes and schools (WHO, 2012).

Exploring models of care within these levels of service delivery is important to ensure efficacious intervention that is contextually responsive and responsible. A model of care is broadly defined as the manner in which health services are delivered. It outlines best practice care and services for the patient or population concerned as they progress through the various stages of a condition or event. A model of care therefore aims to ensure provision of appropriate care by the relevant professionals at the right time and place (Agency for Clinical Innovation, 2013). The use of models of care is valuable in framing EI services as it is one stage within the multi-staged early
hearing detection and intervention (EHDI) process following diagnosis of hearing impairment, and requires the implementation of appropriate and timely intervention to facilitate positive outcomes. The guiding principles of a model of care include, among others, patient-centric care, localised flexibility, and considerations for equity of access, efficient use of existing resources and quality, integrated care. These broader guiding principles align well with the specific EI principles (defined by the Joint Committee on Infant Hearing, or JCIH) that should guide the provision of EI services (JCIH et al., 2013).

As a component of ECI, EI for hearing impairment involves (re)habilitation to prevent the disability posed by restricted hearing from resulting in limited participation in society. Specific (re)habilitation is a multi-staged process that commences with the provision, fitting and adjustment of amplification devices such as hearing aids or cochlear implants, followed by early communication intervention (McPherson, 2014; Peer, 2015). Most developed countries have been able to access hearing health care through private and publicly funded aural rehabilitation systems. However, many low and middle-income (LAMI) countries, where the prevalence of child and adult hearing impairment is substantially higher, have not had these opportunities for access to amplification (McPherson, 2014; Stevens et al., 2011). A lack of access to assistive devices is further coupled with additional challenges in South Africa, such as skilled staff shortages; inequity in health access and quality of care; and health care spending that is primarily focused on improving health outcomes related to life expectancy, decreasing mortality and decreasing the burden of disease (Kerr, Tuomi, & Müller, 2012). Against the backdrop of life-threatening diseases and the prioritisation of primary health care service provision, specialised rehabilitative approaches, such as cochlear implantation, which is essentially a quaternary level of care, are not seen as a priority by the National Department of Health (Kerr et al., 2012).

The provision of affordable assistive devices in a sustainable manner is one of the key elements to successful EI programmes. Yet, in most cases, amplification devices and the related maintenance costs remain unaffordable and may still be regarded as a substantial sum to pay by many families in LAMI countries (McPherson, 2014). Obtaining a cochlear implant involves a lifetime commitment from the families of children with hearing impairment as adequate finances are required in order to access the rapidly developing technology for the rest of their lives. Related costs include assessment, implantation, rehabilitation and maintenance. In addition, families of children must be able to access a specialist facility where cochlear implantation is offered. In South Africa, accessing one of the facilities in the main cities could involve additional travel costs (Kerr et al., 2012). Kerr and colleagues (2012) explored the costs involved in using a cochlear implant in South Africa. Findings from their study revealed that in 2010, the costs for a child for the first five and ten years post implantation were R298 961.
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and R455 225, respectively. While cost remains a major drawback to regular cochlear implantation, there are currently 15 cochlear implantation programmes in South Africa. There is growing interest in the expansion of these programmes (Peer, 2015), which may facilitate access to specialist facilities for EI where the development of spoken language (for congenital hearing impairment) or retention of access to spoken language (for acquired hearing impairment) is the communication system of choice. These specialist facilities, as well as all other EI programmes for hearing-impaired children, should be guided by a set of key principles.

Research indicates that the provision of EI for hearing-impaired children in the first six months of life is likely to result in linguistic, speech and cognitive development that is comparable to that of their typical hearing peers (Ching et al., 2013; Fulcher, Purcell, Baker, & Munro, 2012). Factors that contribute to the outcomes include, among others, quality of intervention services and service delivery models (Ching et al., 2013; Fitzpatrick, Durieux-Smith, Eriks-Brophy, Olds, & Gaines, 2007; Pimperton & Kennedy, 2012; Wake, Poulakis, Hughes, Carey-Sargeant, & Rickards, 2005). These service delivery models may include group, individual, home-based, centre-based and/or inclusive or specialised schooling. The choice of model may vary between countries due to contextual differences, but may also differ as a child transitions through the EI process.

Individual versus group-based early intervention

The implementation of intervention approaches that provide efficient management without compromising quality of care is the focus in some developed countries (Collins, Souza, O’Neill, & Yueh, 2007) and has been provided through a programme called Advanced Clinical Access. This programme is aimed at increasing clinical capacity by offering group sessions with the rationale that more patients could be seen using the same number of resources as required by individual therapy or traditional one-on-one sessions. Collins et al. (2007) argue that sessions in audiological (re)habilitation that are focused on amplification device training and use for new patients can be accommodated in group sessions as information is standardised with common discussion themes.

A few studies have compared the effectiveness of group versus individual therapy or aural rehabilitation in the adult population (Collins, Liu, Taylor, Souza, & Yueh, 2013; Collins et al., 2007). The first study, in 2007, compared hearing aid outcomes in new hearing aid patients who received individual as opposed to group fitting and follow-up visits. Results from the Effectiveness of Auditory Rehabilitation (EAR), Hearing Handicap Inventory for the Elderly, and Satisfaction with Amplification in Daily Life questionnaires
revealed that patients who attended group visits scored better, had improved hearing-related function and wore their hearing aids daily for a longer period (Collins et al., 2007). Similarly, a study in 2013 explored the effectiveness of individual versus group hearing aid fittings and follow-up in terms of hearing-related function, adherence six months post fitting as well as the costs associated with each approach. Contrary to the first study, findings indicated no significant difference in EAR scores or in the total number of hours that patients wore their hearing aids. Group sessions were thus not inferior to individual sessions. However, significantly higher costs were noted for individual fitting and follow-up visits (Collins et al., 2013).

There is a dearth of literature regarding the effectiveness of group versus one-on-one speech-language therapy for children with hearing impairment. Rehman, Khan, Malik, and Ud Din (2016) compared the effectiveness of these two models of service delivery for EI for children with hearing impairment in a developing context. Twenty children between six and seven years of age were enrolled in the study and were assessed both pre and post language intervention. Findings indicated that although both intervention models resulted in improved performance, significant differences in language development were noted between individual versus group therapy. The authors of this study concluded that language development in children with hearing impairment can be more effectively enhanced when group therapy sessions are utilised (Rehman et al., 2016). According to Roman (2018), key lessons to consider when implementing a group therapy approach with hearing-impaired individuals include:

- developing realistic, measurable goals as per any intervention approach
- recognising that group development takes time due to the diversity of backgrounds and expectations
- recognising that the group therapy approach fosters social interaction, which is beneficial in itself
- developing goals that meet the needs of the group while still addressing individual needs through home programmes or exercises.

While both group and individual models of intervention contribute to positive outcomes in children with hearing impairment, the chosen model needs to be considered in light of the long-term benefits as the child transitions through different stages of the EI process. The benefits of individual versus group therapy in terms of social integration and inclusivity when a hearing-impaired child reaches school-going age need to be considered. In this instance, group therapy may afford more opportunity for inclusivity as it fosters diversity and social interaction (Roman, 2018). The choice may also be influenced by context. Group sessions cost less than individual sessions (Rehman et al., 2016). Findings from a study by Collins et al. (2013) also indicated significantly higher costs associated with individual versus group
hearing aid fittings and follow-up. These costs are important considerations for contexts such as South Africa, which have limited budgetary and human resources and, as a result, limited service delivery, which may further impact access to rehabilitation.

Access to rehabilitation in the public health care sector in South Africa is constrained, even in relatively well-resourced provinces such as the Western Cape (Maart & Jelsma, 2013). Research has demonstrated that only 26 percent of children from a peri-urban township in Gauteng accessed rehabilitation services in 2007 (Saloojee, Phohole, Saloojee, & Ijsselmuider, 2007). Assistive devices such as hearing aids were widely unavailable or subject to long waiting lists (Saloojee et al., 2007). The lack of provision of hearing amplification results in delays with the commencement of EI, particularly for spoken language, and has serious short- and long-term implications for children with hearing impairment, including possible schooling difficulties and subsequent lack of employment opportunities (Sherry, 2015). Therapists across South Africa have cited the following reasons for the lack of provision of assistive devices: inefficient procurement processes, lack of budget allocation, lack of transport to collect and deliver devices, and lack of spare parts and repair technicians (Sherry, 2015). Additionally, the availability of adequate human resources remains a challenge to effective EI service provision, and may influence the chosen service delivery model in the public health care sector.

Human resources for rehabilitation in the public sector are subject to the same challenges as other groups of health care professionals. These include international migration, attrition, freezing of posts and relocation to the private health care sector (Sherry, 2015). While there are currently no set staffing norms for rehabilitation services (Sherry, 2015), the number of health care professionals in relation to the number of patients that need to be serviced must be considered in programme planning to ensure adequate and timely service provision. In chapter 2, Kanji discusses hearing health care services in relation to the number of trained professionals in sub-Saharan Africa.

Khoza-Shangase, in chapter 5, provides the most recent Health Professions Council of South Africa (HPCSA) statistics. These statistics indicate that in January 2020, there were 788 audiologists and 1 612 registered speech-language therapists and audiologists. The speech-language and hearing profession in South Africa has an unfavourable professional-to-patient ratio, with an incongruence with regard to capacity versus demand (Khoza-Shangase & Mophosho, 2018; Pascoe, 2011). Posts for speech-language and hearing professionals are also lacking, thus resulting in most communities not having access to these services in the public health care sector (Khoza-Shangase, Kanji, Petrocchi-Bartal, & Farr, 2017). Considering the high patient-to-professional ratio in sub-Saharan Africa, the use of group sessions may be beneficial in addressing human resource shortages. This may in turn result in
reduced waiting lists, which could potentially shorten the timeframes from diagnosis to enrolment in an intervention programme.

While the number of qualified professionals in relation to the population is an important consideration for EI service delivery, the number of experienced clinicians in this field is also important to ensure quality service provision. Kanji and Casoojee highlight the shortage of trained speech-language therapists and audiologists in chapter 7. The EI principles refer to the need for hearing-impaired children and their families to have access to professionals who have the qualifications, skills and knowledge as EI providers to enhance development and well-being, as well as facilitate optimal development in children with hearing loss and any additional disability.

The linguistic and cultural competency of therapists is important considering the diversity in sub-Saharan African countries. Statistics related to the linguistic profile of South Africa indicate that isiZulu is the most commonly spoken home language (22.7 percent), followed by isiXhosa (16 percent), Afrikaans (13.5 percent) and English (9.6 percent). However, English is the most dominant language in the speech-language and hearing profession, followed by Afrikaans (Statistics South Africa, 2011). Qualified speech-language therapists and audiologists are thus not representative of the linguistic and cultural diversity of the country’s population, with a further unequal distribution between public and private health care sectors (Pascoe, 2011). The linguistic incongruence also poses an ethical challenge, as an individual should not be denied intervention due to a language mismatch. However, speech-language therapists and audiologists may not be competent to offer intervention in all languages (Pascoe, 2011). A variety of linguistic profiles among children with hearing impairment may pose further challenges for the clinician in a diverse group therapy approach. This needs careful consideration when adopting such an approach to intervention. Khoza-Shangase and Mophosho (2018) argue that diversity should be embraced as a strength instead of being viewed as a complication.

Cultural awareness is considered the foundation to becoming culturally competent (Wegner & Rhoda, 2015). Campinha-Bacote (2002) proposed a model of cultural competence consisting of five constructs: cultural awareness, knowledge, skills, encounters and desire. Cultural awareness relates to reflection on one’s own beliefs regarding culture. Cultural knowledge can be built by engaging with people of different cultural backgrounds. Cultural skills refer to the health care practitioners’ ability to assess and manage patients while considering the differences within various cultural groups. Cultural encounters and desire refer to an individual’s initiative to experience the differences among cultures.

Considering the current resource-constrained context in sub-Saharan Africa, group therapy may be a viable option. However, it needs to be weighed against other contextual aspects such as the linguistic and cultural profiles
of both patients and therapists, as well as the broader African cultural context. In African culture, the philosophy of ubuntu may be a beneficial viewpoint to consider when deciding on the approach to EI. Ubuntu describes the essence of being human but also adopts a system different from western values in that it stands for ‘I am because we are’, which essentially suggests that there is no ‘I’ without the ‘we’. Ubuntu thus portrays a spirit of oneness and group solidarity, with an emphasis on understanding, collaboration and partnership (Wilson & Williams, 2013).

Collaboration and partnership extend beyond the therapy context to the family context and home environment. ‘Children acquire language within the family context where there is a dynamic interaction between language, culture, values and child rearing practices’ (HPCSA, 2018, p. 28). Hence, families with children who are newly diagnosed with hearing impairment also require information and resources from EI professionals on how to provide an enriched language environment that supports early language learning (Yoshinaga-Itano, 2014).

Home- versus centre-based early intervention

An estimated 474 000 children live with severe disabilities in South Africa, with many more presenting with mild to moderate disabilities (Republic of South Africa, 2015). Appropriate screening and detection of these cases is hampered by the lack of services at a primary health care level as well as the shortage of appropriately skilled staff (Michelson, Adnams, & Shung-King, 2003). Intervention following identification is also hindered by services not being widely available – less than 30 percent of public health facilities offer rehabilitation/community-based rehabilitation services (Ebrahim, Seleti, & Dawes, 2013; Slemming & Saloojee, 2013). These limitations extend beyond the health care sector into early childhood development facilities that do not always provide environments conducive to learning for children with disabilities (Republic of South Africa, 2015). In addition, the current funding model does not make provision for additional funding for programmes for such children (Republic of South Africa, 2015). There is also a need to strengthen the curricula for the training of early childhood practitioners who provide services to infants and young children with disability. Other factors influencing access are adult beliefs regarding whether these children may be included in mainstream programmes, the stigma associated with disability, and that early childhood teaching strategies do not take into account children with disabilities (Republic of South Africa, 2015).

Home-based intervention is a crucial component of EI while children are not yet eligible for institution-based intervention (Couto & Carvalho, 2013; Lichtert & Van Wieringen, 2013). It is particularly beneficial in contexts such
as South Africa where access to EI services remains a challenge. Perceived benefits of home-based intervention programmes include overcoming barriers to participation in EI services as a result of the lack of transportation (Collins, Jordan, & Coleman, 2010); providing intervention in the home environment, which is ideal for determining the strengths and needs of families; and increasing parental involvement in the EI process (Miedel & Reynolds, 1999).

Home-based service delivery systems for EI usually make use of a consultation model whereby the early interventionist visits the family in their home on a regular, scheduled basis (Deiner, 2013). The early interventionist has the responsibility of sharing the necessary information with the family regarding service resource availability, answering questions posed by parents about their child’s impairment or disability, modelling or demonstrating appropriate activities for working with their child (Deiner, 2013) and possibly also serving as a liaison between the medical and educational sectors. Literature suggests that three aspects of home-based programmes are critical to their success (Azzi-Lessing, 2013):

- the quality of the relationship between the consultant or early interventionist, the child and the family
- the characteristics, training and support of the consultant or interventionist, as some families may be more comfortable with an individual who shares their cultural background and is able to communicate easily in their primary language (Azzi-Lessing, 2013, 2017)
- the ability to match the services delivered to the specific needs of the families and that meet their expectations (Azzi-Lessing & Schmidt, 2019).

This type of home-based intervention engages the family of the hearing-impaired child, lays a solid foundation and facilitates decision-making by families regarding mode of communication and other intervention strategies (Yang et al., 2015). A study conducted by Yang and colleagues (2015) revealed that home-based intervention facilitated understanding of common phrases and conversation in 78 percent of the children, and 98 percent were intelligible to the listener. These authors concluded that habilitation within the first 12 months after fitting of amplification is a key stage for auditory and speech development in hearing-impaired children.

In 2006, the HI HOPES (Home intervention: Hearing and language opportunities parent education services) family-centred, home-based support programme was established in South Africa’s Gauteng province. This programme currently provides free EI services for children (from birth to three years of age) with mild to profound degrees of hearing impairment and their families in five of the nine provinces in South Africa. Children and their families are either self-referred to these services, or referrals are made by professionals (HI HOPES, 2019; Störbeck & Young, 2016).
The HI HOPES programme comprises family support and language development interventions that have been adapted from the SKI HI curriculum (SKI-HI Institute, 2004). The SKI HI Language Development Scale is a norm-referenced assessment performed shortly after enrolment into the programme. Language development is monitored and assessed every four months, with the Bayley Scales of Infant and Toddler Development being conducted every six months (Störbeck & Calvert-Evers, 2008). Home interventionists from a variety of vocational backgrounds, including teachers, audiologists, speech therapists and deaf mentors conduct regular home visits, and are suitably matched to the families in terms of culture. The language development intervention aspect of the programme is not biased toward any form of communication approach (sign language, spoken language or a mix). There is also no bias toward the type of amplification device – hearing aids, cochlear implants, bone-anchored devices – fitted for the hearing-impaired child (Störbeck & Young, 2016). Since the HI HOPES programme only caters for children up to three years of age, there is a need for integration and transition to a preschool or other educational setting (Störbeck & Calvert-Evers, 2008). While home-based intervention may be beneficial in terms of providing cost-effective access to families in LAMI countries, this type of service delivery model is highly reliant on follow-through by families. Due to consultants or early interventionists typically working according to a daytime schedule, the caregiver that is at home has the responsibility of carrying out the intervention and interpreting the information from the consultant for the other family members (Deiner, 2013). In instances where families are headed by single parents or caregivers, very young parents, elderly grandparents, chronically ill parents or caregivers, more support is required from the early interventionist. Although a primary-caregiver-centred approach is often considered, extended family members, grandparents and daytime caregivers may also be trained to achieve intervention goals in the African context (SASLHA Ethics and Standards Committee, 2017). The role and definition of family in Africa is discussed in chapter 11.

Centre-based EI service delivery systems may be based in a variety of contexts and usually comprise a team of specialists. Staff at these EI centres are usually well trained in special education and therapists conduct assessments, provide therapy in the setting and contribute to the child’s educational programme (Deiner, 2013). According to the National Integrated Early Childhood Development Policy in South Africa, centre-based programmes are partial care facilities that focus on early learning and development of children from birth until the year before entering grade R or formal schooling (Republic of South Africa, 2015). While access to these early childhood development programmes is increasing, access to early learning and care remains inequitable, especially for vulnerable children (Republic of South Africa, 2015). This is primarily due to the cost, which is
unaffordable for many parents or caregivers of affected children (Republic of South Africa, 2015).

Centre-based EI programmes in South Africa are often located in pre-primary or preschool settings, and include but are not limited to the Children’s Communication Centre in Johannesburg, Whispers Speech and Hearing Centre in Pretoria and the Carel du Toit Centre in Cape Town. Some of these centres collaborate closely with audiologists in both the public and private sectors, offer EI outreach programmes, and act as resource centres for parent and teacher training. Two studies exploring the enrolment and outcomes of children with hearing impairment in centre-based EI programmes revealed suboptimal initiation of these services due to late identification of hearing loss (Maluleke, Khoza-Shangase, & Kanji, 2019b). As a result, these children presented with below average communication skills and school readiness abilities (Maluleke, Khoza-Shangase, & Kanji, 2019a)

Special schooling versus mainstream inclusion
Childhood development is embedded in education, which impacts on the progression through life (United Nations Children’s Fund [UNICEF], 2016). All children, including those with disabilities, should thus have access to quality education to ensure literacy and participation in society as well as assist in enhancing both the social and economic security of individuals (UNICEF, 2016). However, in sub-Saharan Africa (UNICEF, 2016), children with disability are disproportionately affected by a lack of access to education and are far less likely than their peers to access quality education (UNICEF, 2016). There are more than 40 schools for the deaf in South Africa. In addition, the Institute for the Deaf in Worcester operates a deaf college which trains deaf people for jobs, and the University of the Witwatersrand in Johannesburg has a Centre for Deaf Studies that offers programmes in deaf education (Government Communications, 2016).

A number of policies and programmes support education for children with disabilities in many countries in eastern and southern Africa. One is the UN Convention on the Rights of Persons with Disabilities (CRPD), which states in regard to education that children with disabilities must (UNICEF, 2016):

- not be excluded from the general education system
- be afforded access to an inclusive, quality education
- be provided with support and reasonable accommodations to facilitate learning
- be able to access alternative means of learning or communication such as sign language
be able to receive education in their respective mode or means of communication
be taught by teachers who are qualified in the respective means or modes of communication (including teachers with disabilities), and who are trained in disability
be made aware of the use of appropriate augmentative and alternative modes, means and formats of communication.

Countries in sub-Saharan Africa that have signed and ratified the CRPD protocol include Angola, Burundi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Uganda, Tanzania and Zimbabwe. Botswana, Eritrea, Somalia and South Sudan have not done so. Hearing impairment is one of the most commonly identified and recognised disabilities, and appears to have been formally recognised in Angola, Botswana, Eritrea, Ethiopia, Kenya, Malawi, Namibia, Rwanda, South Sudan, Swaziland, Uganda, United Republic of Tanzania and Zimbabwe (UNICEF, 2016).

‘Special educational needs’, ‘disability’ and ‘inclusive education’ are common terms utilised in studies from various country contexts. ‘Special educational needs’ is sometimes used interchangeably with the term ‘children with disabilities’. In some instances, children with disabilities are viewed as a subgroup of children with special educational needs. Inclusive education has commonly been viewed in terms of the educational placement of the child to avoid segregation, for which special needs schooling is often critiqued (Haug, 2017; Mitchell, 2017). However, it has been suggested that this may be a narrow approach to defining inclusive education, and that an alternative may be to define inclusive education not as complete membership in a mainstream classroom, but rather as the best place for learning (Haug, 2017).

The definitions of these terms have been disputed as disability is also interpreted as an interaction between impairment, the environment and personal factors (WHO, 2002). For example, a child with a hearing impairment may not be able to effectively participate in a mainstream school due to a variety of factors that act as barriers or enablers at individual and environmental levels (Figure 8.1).

A child’s participation in a mainstream environment may be influenced by personal factors or barriers such as the severity of the hearing impairment, and how much spoken language has been acquired if it is a postlingual hearing loss. Participation will also be influenced by how these factors interact with other enabling factors, such as the availability of hearing amplification, and teacher training and involvement. Other demand-side factors also play a role, such as parental views, an appropriate curriculum, learning materials or resources, and teachers’ adequate understanding of the hearing impairment (UNICEF, 2016).
Inclusive education remains in a pilot phase in much of sub-Saharan Africa (Mariga, McConley, & Myezwa, 2014; Srivastava, De Boer, & Pijl, 2015). This is due to various barriers that hinder participation of children with disabilities, and obstruct the realisation of inclusive education (Mitchell, 2017). These barriers include lack of infrastructure and resource constraints which result in inadequate provision of education and disproportionately disadvantage children with sensory or motor impairments (Abdo & Semela, 2010; Mariga et al., 2014; Tassew, Jones, & Bekele, 2005).

### Solutions and recommendations

A model of care for EI for children with hearing impairment needs to be developed for the South African context to ensure that change is effected through consistent improvements in service delivery that is contextually responsive and responsible. These models of care need to be evidence-based and linked to national strategic plans and initiatives by government in both the health and educational sectors. Due to the involvement of various stakeholders in the EHDI process, these models of care need to be developed in collaboration with clinicians, educators and families of children with hearing impairment. This is particularly important as the journey of the child with hearing impairment extends across different service providers (Agency for Clinical Innovation, 2013).

Since EI commences following fitting of amplification, there is a need for effective provision of hearing amplification devices. Hlayisi and Ramma (2018) propose a multi-pronged approach to ensure that supply meets the need for the provision of hearing aids. These authors suggest that audiologists in developing countries advocate for increased budget allocation and explore low-cost hearing amplification devices and rehabilitation intervention. One
such low-cost intervention approach is group therapy, especially when considering the shortage of skilled human resources in South Africa.

EI should commence with home-based intervention services delivered by professionals trained specifically in managing hearing impairment. This will allow for early language learning and provide support for families with children with hearing impairment. South Africa could provide support for the development of these services to other countries in the sub-Saharan region given the establishment of home-based intervention programmes nationally. Due to the shortage of skilled professionals, alternative methods should be explored to increase access to services in South Africa and across sub-Saharan Africa. One such alternative method is the use of remote service delivery or tele-intervention, with innovative use of task shifting as a delivery model. A task-shifting model should include training the caregivers of children with hearing impairment, who are then able to provide services to other families. This will assist in expanding human resources to deal with patient demand in homes, centres and schools, with the added advantages of capacity-building, community engagement, caregiver empowerment and creation of local jobs and new opportunities for caregivers of hearing-impaired children (WHO, 2007).

Tele-intervention is a viable option in contexts where it is difficult or too costly for the health care practitioner to consult with the patient in person (Havenga, Swanepoel, Le Roux, & Schmid, 2017). Implementation of these services has resulted in practitioners saving time and resources, and increasing their reach. In addition to practitioner benefits, parent benefits include satisfaction as a result of reduced cost, reduced waiting lists and fewer travel arrangements for appointments. A study conducted in South Africa revealed no significant differences between tele-intervention and conventional face-to-face intervention in terms of the communication performance of children with hearing impairment (Havenga et al., 2017). Despite both methods being effective, the choice of preferred intervention needs to be made in consultation with the family and needs to take into account contextual factors such as access to technology (Havenga et al., 2017). Khoza-Shangase explores the use of tele-audiology in an educational setting in chapter 9, and Naudé and Bornman highlight the core ethical aspects around implementing tele-audiology for EHDI in chapter 13.

Home-based intervention programmes need to act as a referral source for centre-based intervention once children reach the age of three to ensure continuity of care. Referral pathways are often the focus in the early detection of hearing impairment in order to ensure timely diagnosis. An equal focus needs to be placed on the EI stage to facilitate transition through the EHDI process.

Irrespective of the service delivery model or approach to EI, effective service provision should be cognisant of the principles related to the models of care, and should include the contextual diversity in South Africa. Provision of
appropriate service delivery should commence during student clinical training and should ensure that cultural awareness forms part of the undergraduate curriculum, particularly as it is the cornerstone of cultural sensitivity.

The government’s promulgation and ratification of relevant policies specifically geared towards managing hearing impairment is the first step to actualising ECI at an effective level. Intrinsic to this is EI service access for those with hearing impairment. Health care professionals and teachers need to collaboratively advocate for access to these services in less developed contexts, particularly those where a high percentage of childhood disability exists. All educators and teachers should have some training in childhood disabilities, which should be initiated in the university curriculum, as this will assist in reducing communication barriers with respect to inclusive education.

Conclusion
The importance and benefits of EI are well known. While there are defined principles for EI in children with hearing impairment, they are not always implemented in developing world contexts, specifically countries in sub-Saharan Africa. Home-based EI may be more accessible for parents and families in these contexts, and group therapy a more cost-effective and resource-savvy approach to EI. However, linguistic and cultural diversity need to be considered when implementing a specific approach to EI. At present, inclusive education and special education needs remain a challenge in sub-Saharan Africa due to resource limitations and a lack of trained educators. This must be considered in proposed EI strategies.

References


