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Best practice in audiology: context matters

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Historically, modern audiology evolved from the United States of America (USA) after the Second World War, where hearing rehabilitation programs were established across the country. Since then, audiology practice and the profession as a whole has expanded from the west to the far east and global south with considerable contextual variations. Thus, the purpose of this paper is to increase conversation and engagement on definitions and the drawbacks of a single lens approach to the use of best practice guidelines in Audiology. It is important to develop a more expansive lens as influenced by different contexts such as Africa, Asia, and South America that will in turn help facilitate a multidimensional approach to audiology practice and what is considered “best practice.”

KEYWORDS

best-practice, contextualization, evidence, guidelines, global-audiology, multidimensional approach

The beginning and evolution of audiology practice

Historically, mankind over the past centuries had developed different solutions to hearing and vestibular disorders amongst the different ancient civilizations of the world such as the Egyptians, Babylonians, Greeks, Hindu, Byzantine, etc. Some work was recorded as early as 1500 BC. In one of the earliest classic scientific documents, Eber's Scrolls from Egypt, there are descriptions of battle wounds on temporal bones and how they affected hearing and speech. Similarly, another Egyptian text documented a chapter on “*Medications for the hard of hearing ear*” where treatment could be found for tinnitus, dizziness and hypacusia (Hawkins, 2004). The Greek philosopher Empedocles of Agrigento in Sicily (504–433 BC), was the first to describe the cochlea, named after a seashell found in the Mediterranean region (Gitter, 1990).

Modern audiology evolved from the United States of America (USA) after the Second World War, where hearing rehabilitation programs were established across the country. From this period audiologists have been collaborating with otologists and researchers in related fields to develop techniques to determine not only the degree of hearing loss but also the site of the patient's lesion in the middle ear, cochlea or retrocochlear structures (Jerger, 2019). These techniques developed over time and expertise have become the bedrock of the key technical skills that laid the foundation for the global professionalization of Audiology.

Global professionalization of audiology

Professionalization is described as the process of acquiring a professional status (Hoyle and John, 1995) characterized by obtaining scientific knowledge through higher education to develop disciplinary skills and competencies (Abrahams et al., 2019). Among health professions, medicine was the first Western profession to achieve wide professionalization and professional autonomy (Brosnan, 2015). Newer emerging professions, especially rehabilitation occupations such as audiology are said to have galvanized resources, status, and influence of medicine as a platform for their own professional development with an empirical, positivist frame (Abrahams et al., 2019). Professions hold the power to determine ways to think and act in their domain of expertise and that power is realized through the formal education process where students learn how to see and think about the world (Montigny, 1995; Evetts, 2014; Abrahams et al., 2019).

For Audiology, the first university program was offered at Northwestern University in the USA, in 1946 under the guidance of Raymond Carhart (Jerger, 2018). During the 1950–60's, audiology practice started emerging in community speech and hearing centers in America, geared primarily to aural rehabilitation and in medical settings audiologists began conducting hearing assessments in Ear Nose and Throat (ENT) clinics (Jerger, 2019). The 1970 and 80's saw the emergence of subspecialty areas: pediatric audiology, educational audiology, industrial audiology, cochlear implants, and assessment of balance function (University of North Carolina, 2021).

Expanding audiology into varying contexts

Since the inception of audiology professionalization to date, audiology practice and the profession as a whole has expanded from the west to the far east and global south. With this expansion into different regions in the world and growing number of audiology professionals trained, it can be argued that to date training is heavily influenced by North American and British educational models (Tuomi, 1994; Pillay and Kathard, 2018) with limited considerations of the considerable contextual variations needed in curriculum content and clinical practice. Pre-existing evidence on ancient, diverse, indigenous, and regional contextual approaches to hearing care may be overlooked or obscured by operational training and education models that are predominantly reflective of the foundational audiology program largely from the west and global north.

Both knowledge and training should be reframed to include all of the vastly different contexts in which hearing care is provided across the various regions, including the far east and global south (Ng, 2012). This reframing is encouraged by the United Nations (UN) report on indigenous peoples' access to health services (United Nations, 2015) on the inclusion of indigenous knowledge, with content that is diverse, context specific, and relevant. These aspects may be relevant in developing curriculum and training for hearing care professionals (Khoza-Shangase and Mophosho,

2018, 2021). As such, literature on contextual relevance in the profession of audiology argues that the professionalization process may be using a single lens that views the western knowledge as the only norm, and inadvertently impact what is considered current best practice (Mignolo, 2009; Ng, 2012; Khoza-Shangase and Mophosho, 2018, 2021).

Current best practice terminologies and descriptions

Currently most healthcare professional bodies use position statements, best practice recommendations and/or clinical practice guidelines to describe how audiology clinical services should be provided. These terminologies are used interchangeably, yet they do not always mean the same. While a clear distinction between position statements, best practice, recommendations and clinical practice guidelines is yet to be made in audiology literature, these descriptions are often used as a blueprint for clinical practice, audiology education, as well as research in audiology practice (see Table 1).

Implementation of “best practice”

A good practice (method or technique) that has consistently shown results superior to those achieved with other means is often used as a benchmark. The best practices might be used as a kind of checklist against which one can directly evaluate a system's design and code. Lack of adherence to any given best practice, however, does not necessarily imply a lack of quality; they are recommendations that are said to be “best” in most cases and in most contexts, but not all. “A best practice is always subject to improvement as we learn and evolve together” (Mukherji and Albon, 2014). So, this means that guidelines are good, but not always implementable. And best practice is good to get positive results, yet if we do not follow it, it does not mean poor quality. What these definitions do is, they provide the flexibility to factor-in contextual variations such as availability of resources, priorities of different countries, needs of the population, prevailing policies, and power imbalances.

The benchmark descriptions (best practice/guidelines/position statements) are often decided by consensus approach, or evidence-based methods by a group of clinicians/academics/researchers. However, the evidence is often out of context. Therefore, when best practice is viewed from an impact outcome perspective, then contextual variations have to be factored in. “Evidence does not make decisions, people do” (Haynes et al., 2002). Hearing health and illness beliefs differ among populations across the world. For example, South African traditional healers often seek the source of illness (including ear-related diseases) in the supernatural realm (de Andrade and Ross, 2005). Thus, evidence-based practice needs to take into account the heterogeneity of the nature and needs of the context in order to be relevant and implementable (Scheppers et al., 2006; Narayansamy et al., 2014).

TABLE 1 Current terminologies and descriptions on “best practice.”

Term	Definition
Best practice	“Best practice” is defined as “...professional procedures that are accepted or prescribed as being correct or most effective” (Oxford English Dictionary, n.d.).
Practice guidelines	“Systematically defined set of recommended procedures based on available scientific evidence and/or expert opinion that have been designed to yield specific, well-defined outcomes” (American Association of Audiology, n.d.)
Evidence based practice	“Evidence-based practice (EBP), incorporating all areas of healthcare, involves the integration of the best available research evidence with clinical expertise, the clinical context and the client’s preferences and goals” (Wong and Hickson, 2012, p. 3).
Standards	“Standard” is considered as something established by authority, custom, or general consent as a model or example (Merriam-Webster, n.d.).

Audiology best practice and evidence: context matters

The limitedness of context specificity in the existing models of professionalization and clinical practice in Audiology may largely be creating a single lens view to what is best practice, or evidence-based practice. Similar to other rehabilitation professions, the hearing care profession is filled with conventions especially about what is objective and/or subjective evidence (Pillay and Kathard, 2018). Some anecdotal examples of a one size fits all/single lens approach that are some of the basis for this discussion paper are described in Table 2.

Clinical guidelines vs. practice context

If the specific example of Early Hearing Detection and Intervention Programs is considered, the guidelines given by The Joint Committee on Infant Hearing (2019) for screening, diagnosis and intervention is an aspirational guideline that many countries have adopted. However, in reality, implementing this evidence-based guideline, for example, in a country like India has been challenging. This is because India serves a population that is predominantly rural, where births are largely at primary health care clinics that are at far distances from tertiary care centers having infrastructure for hearing screening or diagnosis. Further, a significant proportion of births still occur at home (Ou et al., 2021). Also, resources (equipment, professional, and infrastructure) are allocated to the more prevalent or lifesaving conditions. Additionally, the recommended screening and diagnostic tools such as OAE and AABR have not been affordable (one time purchase cost, plus annual servicing/maintenance multiplied by the number of birthing centers).

Therefore, low-cost behavioral measures that are sensitive tools to screen more severe hearing losses (Ramesh et al., 2012) is an alternative to be considered until such time that the country can afford to detect/identify mild hearing loss. Similarly, check list based high-risk screening and behavioral observation audiometry at remote birthing centers followed by referral to tertiary care centers was found to improve screening coverage (Rajpoot et al., 2023) in a developing country setting.

Outcomes of implementation in settings where health care services are self-financed will differ considerably from publicly-funded services (Olusanya, 2012). Therefore, it is prudent for countries to develop guidelines based on existing context, with consensus among all relevant stakeholders such that it is currently feasible to improve the situation of EHDI within that setting. The impact outcomes of such implementation has the potential to eventually guide improvements in resource allocations that are closer to the evidence-base.

Premise to contextualize audiology training

Using South Africa as an example where there are several cultures, ethnicities and belief systems, research has continued to argue for cultural contextualization for the adaptation of knowledge, methods and approach in the teaching and training of audiologists (Khoza-Shangase and Mophosho, 2018, 2021). South African researchers, Pillay and Serooe (2019) highlight the prominence and use of traditional healing as a source of hearing healthcare for many South Africans of varying spiritual, religious and cultural beliefs. However, there seems to be no acknowledgment and or openness to explore the value of traditional care models for audiology within curriculum and or research (De Andrade, 2011; Pillay and Serooe, 2019). Thus, graduates produced for practice in South African audiology through the current global north influenced curriculum are often found completely dismissing the option to even ask in case history if clients consult with traditional or cultural healers (Pillay and Serooe, 2019).

Health beliefs as a whole are not often acknowledged in guidelines used for training. If the example of South Africa is used once more, another area in audiology where contextualization would be culturally responsive is with the South African guidelines on audiological management of ototoxicity (Health Professionals Council of South Africa, 2018) that are used widely in training. Particularly, within the guidelines, there is the inclusion of the term *all* in the ototoxicity monitoring recommendation: “All patients on ototoxic medication presenting with these risk factors must be monitored ...” This here is an example of how this recommendation does not consider or allow for the autonomy of patients with health—and/or illness beliefs different to the guidelines’ authors.

TABLE 2 Examples of a single lens view vs. a context based view.

Area of audiology	Case example of single lens view	Case example of a context based view
Education	Teaching audiology using resources, tools, books, methods and in a language that emerged from contexts that are dissimilar from where it is being taught without contextualization	Teaching audiology based on knowledge and resources that emerge from the context where it is being applied, embracing a diverse evidence base from regional/local knowledge and languages
Clinical	Implementing early hearing detection and intervention programs using protocols and benchmarks of a developed country with outcomes based on resource capacity	Implementing early hearing detection programs based on context based on attainable goals and available resources (professionals/costs/equipment/test environment/cultural needs)
Research	Reviews and feedback on research (publications/conference abstracts/grant applications) from diverse practice settings including low and middle income countries, based on perceived applicability/international appeal using an international consensus peer review method with reviewers often based in developed countries/context	Reviews and feedback on research enabling input from local context from where the work originates as well as a broader approach that showcases on an international level what is being done in different contexts

Context specific practice guidelines

Context can be described as the broad circumstances and environmental characteristics or settings (Damschroder et al., 2009) in which health care services are implemented. Therefore, apart from the training, competence, and professional influences of the audiologists, the delivery of services is influenced by a number of additional contextual factors. Local infrastructure (including test environment), social fabric, financial resources, legal and socio-political climate, are some examples of these factors that have an impact (Watson et al., 2018).

Often capability, opportunity, and motivation of professionals have been attributed to lack of compliance to professional guidelines in audiology (Goulios and Patuzzi, 2008; Watson et al., 2018; Marques et al., 2022). While guidelines are driven by knowledge, “Knowledge to Action” is not spontaneous and requires one to “Adapt knowledge to local context” (Moodie et al., 2011). While exploring why audiologists do not adhere to best practice, the lack of understanding of internal conditions for the individual hearing healthcare practitioner [and their] social and physical work environment was speculated as a possible reason (Shaw, 2012).

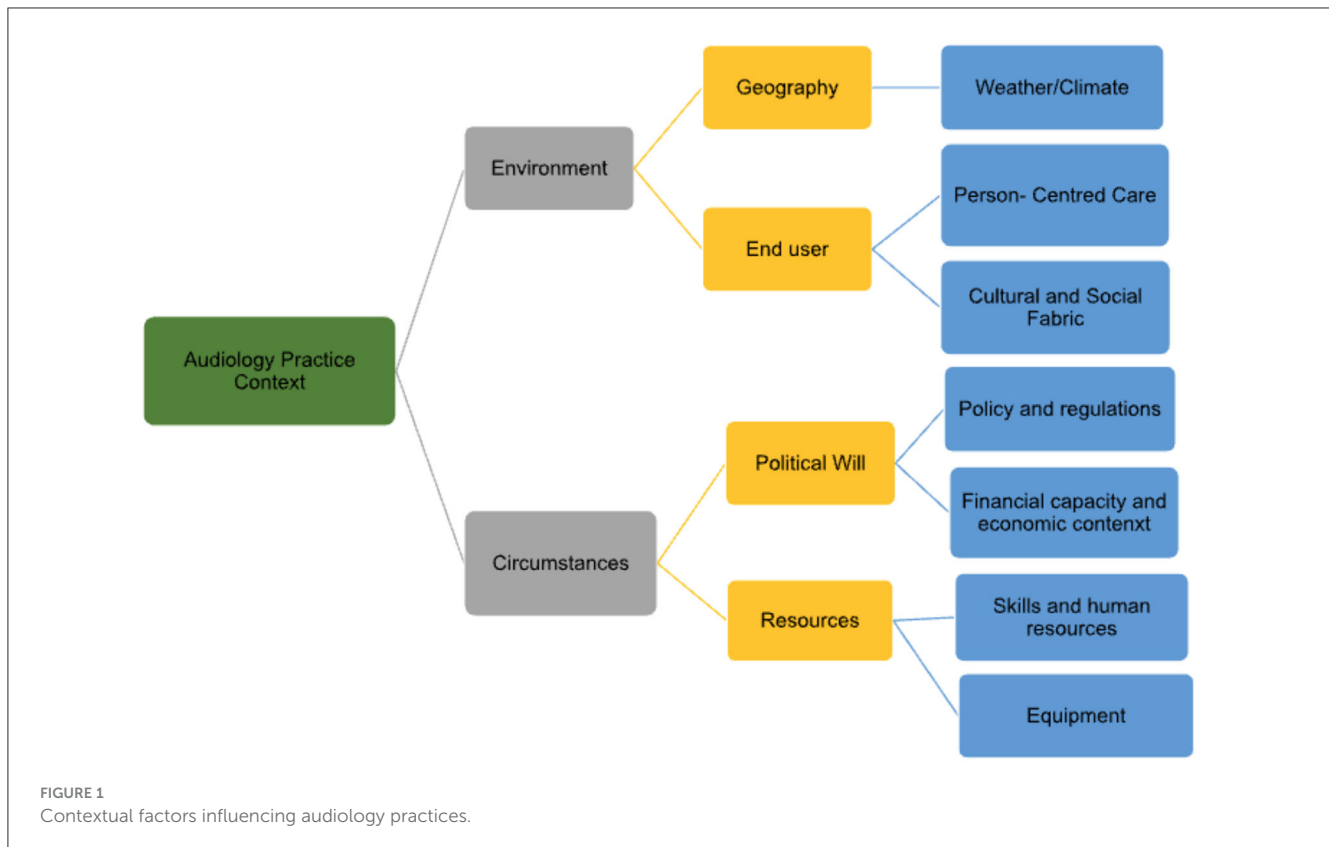
In low and middle income countries, hearing care services are provided by various cadres of service providers including community volunteers, school teachers, special educators, audiometrists, other allied professionals, audiologists, and even otolaryngologists. These are often based on the level of capacity of individual countries to have a specialized workforce to provide hearing care services. Therefore, a vast difference exists in audiology practices based on the local context and setting prevailing in that region. To account for some of these, many local professional bodies have developed their own guidelines (Indian Speech and Hearing Association, 2017; HPCSA, 2021; SACIG, 2022). While such practices may not meet “benchmarks,” they may still cater to the ear and hearing care needs plus fill service gaps that exist in that region.

This paper would like to propose that *practice context* should be factored into audiology best practice engagements and guidelines. We propose a process of *contextualization* which according to Ernstzen et al. (2019) is based on the premise that clinical practice guidelines produced in one place, timeline and context may not be appropriate for implementation across

varying contexts due to differences in the healthcare systems, socio-cultural, societal, policy and economic contexts. Therefore, contextualization requires identification of *practice context* to which existing practice guidelines must be tailored to (Siegfried et al., 2018). In the schematic (Figure 1) we propose some of the contextual factors that can influence audiological practices and have broadly classified them into (i) environment (related to the physical environment and end-users) and (ii) circumstances (related to other variables that directly influence service provision; Watson et al., 2018).

These are described with some case examples below:

- *Environment:*
 - Geography:
 - *Weather/climate*—influences travel access (e.g., snowy mountains of Bhutan, deserts of Afghanistan), working hours (which in turn alters service availability), allowable/feasible testing time and protocol (e.g., in the mountains of Bhutan having test sessions across multiple days is challenging and there will be non-compliance due to difficulty in returning as a result of long distances). Therefore, conclusive time efficient test batteries may have to be conducted in single sessions.
 - End users:
 - *Person-centered care/Patient care practices*—Is it participatory culture or top-down (medical model) or advocacy-rights based culture that prevails in the context where audiology services are provided? The dominant culture will dictate the choice of services (e.g., Deaf vs. deaf).
 - *Cultural and social fabric*—stigma around disability, language (influences test tool choices), belief systems, and local practices.
- *Circumstances:*
 - Political will:



- *Policy and regulations*—will decide what benefits are provided (free hearing aids, cochlear implants, travel concessions, or educational concessions, etc.), who will receive benefits (children and adults).
- *Financial capacity and allocation/economic context*—Resources- types of schools, type of rehabilitation.
 - Equipment (e.g., otoscopy vs. tympanometry to rule out middle ear pathology).
 - Human Resources (e.g., community worker vs. audiologist performing basic hearing testing).

Conclusion

Audiology practice and the profession as a whole has grown since the main inception era and the footprint of audiologists has expanded to reach each continent. This paper seeks to increase engagement on development of *context influenced* best practice definitions, evidence gathering and evaluation methods as well as a multifaceted regional approach to the implementation of practice guidelines. We believe that it is crucial to expand audiology and the practice thereof in each region based on the milieu such as those in Africa, Asia and South America. This expanded lens can begin with a relook at how the profession defines *best practice* and we propose that the *audiology practice context* be used as a multifactorial and multifaceted lens to *contextualize* existing best practice guidelines.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

V-GH: Conceptualization, Visualization, Writing – original draft, Writing – review & editing. VR: Conceptualization, Project administration, Visualization, Writing – original draft, Writing – review & editing. LP: Conceptualization, Visualization, Writing – original draft, Writing – review & editing. BV: Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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