"We Teddy": A Device to Connect Speech Pathologists, Audiologists, and Caregivers Throughout Aural (Re)Habilitation Management

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Abstract

Communication between multidisciplinary specialists and caregivers is essential for sharing client data, developing a management plan, and updating client cases; however, speech-language pathologists, audiologists, and caregivers can struggle to communicate effectively due to the lack of a sufficient device or system that keeps them connected. This inadequacy negatively impacts a hearing-impaired client's quality of life, including educational opportunities and social bonds. Thus, the "We Teddy" device is designed to provide professionals and caregivers the opportunity to effortlessly connect and communicate about client results and progress, leading to better client outcomes.

Index terms: speech-language pathologist, audiologist, caregiver, client, aural rehabilitation, "We Teddy" device, interprofessional communication.

Introduction

In the fields of speech-language pathology and audiology, the need for practitioners to stay connected with each other and caregivers is essential to effectively monitor client progress. Speech-language pathologists (SLPs) often experience significant difficulties in communicating with other practitioners and caregivers about aural (re)habilitation management sessions. For instance, during a speech-language evaluation, a pediatric client may be referred for a speech disorder; however, if the SLP and the audiologist (Aud) do not communicate, a client's hearing loss may remain undiagnosed; unfortunately, this can and does occur. Because SLPs and Auds share a vital connection in the management of clients with hearing impairments, SLPs are often concerned about the lack of direct contact with Auds, who are responsible for the results of the client's hearing test (audiogram) and ear pressure test (tympanogram). These two tests are the

foundation of an aural (re)habilitation program and measure the severity of the client's hearing loss. Thus, after the Aud's assessment, the SLP begins the (re)habilitation program.

Aural (re)habilitation (AR) is "a problem-solving process aimed at minimizing disability and avoiding or minimizing the resultant handicap" (Stephens, 1996, p. 57). Hearing impairment seriously affects an individual's communicative and social functions (Kyle et al., 1985; Nobel, 1986), leading to emotional problems that severely impact the quality of life (Carmen, 2001; Hull, 1995; Roykjar & Pedersen, 1997; Skollerud, 1996; Tesch-Romer, 1996). Therefore, AR aims to enhance a client's quality of life through a combination of auditory training, speech-language assessment and treatment, communication strategies, and counseling. Creating a working environment where SLPs and Auds collaborate within the scope of their practices leads to successful communication and trust between team members, caregivers, and clients. In such an environment, the collaboration between SLPs and Auds is the primary relationship necessary for the success of therapeutic outcomes (Montano, 2014). Therefore, improving the joint contributions of these specialists will benefit both care providers and clients, leading to increased provider satisfaction and optimal client care. According to Health Force Ontario (2010), the successful establishment and implementation of interprofessional collaboration are dependent on the collaborative efforts of various individuals and organizations, including, but not limited to, government, regulatory bodies, policymakers, health and social care professionals, health care professional organizations, educators, researchers, clients, and families.

Because of the need for direct connection, the "We Teddy" device supports multidisciplinary teamwork, including caregivers, to help clients reach their goals efficiently. In keeping with the development of evidence-based interventions in communicative sciences and disorders (Bernstein Ratner, 2006; Finn, 2011), practitioners must consider systematic approaches to the selection and use of technology. Moreover, SLP training programs are responsible for teaching and modeling critical technology-related skills for practitioners. Therefore, to achieve advanced communication and academic goals, assistive technology increasingly plays a significant role in helping hearing-impaired clients with communication difficulties.

"We Teddy" is an electronic device that aims to help health care professionals stay connected and updated with each other despite the differences in professional settings. Furthermore, "We Teddy" helps caregivers and clients remain well informed about results given and improvements made during management sessions. Every "We Teddy" device has a memory

card that saves all client results and progress reported by SLPs and Auds; consequently, caregivers and clients can benefit from having their own "We Teddy."

To illustrate the effective use of the "We Teddy" device, consider a scenario where the Aud first saves audiogram and tympanogram results on the memory card, followed by the SLP saving the first stages of AR (e.g., detection, discriminations of sounds, etc.) along with an individualized client plan. "We Teddy" can then share the notes from the Aud and SLP with the caregiver and client, allowing them to review results and outcomes at home. In this manner, "We Teddy" can keep specialists updated and connected about the client's case while helping the caregiver review results and plans at home with the client.

Potential uses for the "We Teddy" device

Effective communication between SLPs and Auds can help to inform the caregiver and maximize the client's quality of life with an established treatment plan that targets relief from suffering due to hearing impairment and ineffective communication. In 2020, the World Health Organization (WHO, 2020) reported that approximately 466 million people worldwide have disabling hearing loss, and 34 million of these are children. The "We Teddy" device can serve this significant population in the following ways:

- For audiologists
    - Save all test results on the memory card
    - Maintain a copy of the last hearing aid programming input on the memory card
    - Facilitate the review of SLP progress and feedback notes about hearing aids and cochlear implants
    - Save updates on client progress

- For speech-language pathologists
    - Facilitate connections with other primary professionals (e.g., otolaryngologists and neurologists)
    - Allow for the review of the Aud's test results
    - Provide an overview of the basics stages of aural (re)habilitation
    - Facilitate the sharing of home programs with caregivers and clients

- For caregivers
    - Raise awareness of the collaboration of the multidisciplinary team
    - Facilitate the review and implementation of home programs with the client
    - Contribute to the client's awareness of results and progress

Moreover, "We Teddy" is also appropriate for use in other medical applications, including otolaryngology management, psychology management, and hearing aid and cochlear implant specialization.

To conclude, if primary care professionals can clearly and easily communicate with each other and caregivers, clients with hearing impairments that require a prolonged treatment process may experience earlier interventions and a more rapid increase in communication skills.

Objective

The objective of this study is to help health care professionals, namely SLPs and Auds, communicate directly with each other, caregivers, and clients through the "We Teddy" device. Moreover, caregivers and clients may also benefit from the "We Teddy" device through the review of updated results from all practitioners.

Scope of the project

When clients have a hearing impairment, whether unilateral or bilateral, they are unable to communicate effectively. This study focuses on easing communication between different service providers and clients to help them stay connected and more easily follow the process of AR, thereby making treatment more accessible and successful.

Methodology

The "We Teddy" device is useful for hearing-impaired clients and health care professionals to communicate. "We Teddy" is an electronic device with two sizes that is shaped like a small bear to attract users who are mostly children. The material of this original design is metal, with disk and cotter pins (twistable fasteners) that attach the legs, arms, and head to a body that is firmly stuffed to support the pins. The internal parts consist of voltage regulators and a radio frequency

(RF) module. “We Teddy” also includes a memory card with software that stores client information. The design is functional for use in a clinical setting and is easily sterilized for safe use with all clients.

“We Teddy” has multiple purposes: it serves as a reinforcement for pediatric clients, an audiology button, a speech-language pathology button, and an information storage unit for client case files and reports. “We Teddy” acts as a reinforcement for the child as it is toy-shaped and plays music that simulates the Ling Six Sound Check, a behavioral listening check to determine a cochlear implant’s effectiveness. The audiology button allows other clinicians to access the most updated audiological information about a client case, such as the type of tympanogram and the level and type of hearing loss. Auds provide this shared information through proprietary software downloaded from the “We Teddy” memory card; moreover, Auds can select present options with a limited number of answers for each client related to the clinician’s most common audiological concerns.

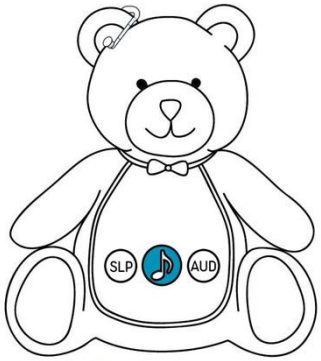


Figure 1. Three buttons for clinician use (SLP, AUD, and Music)

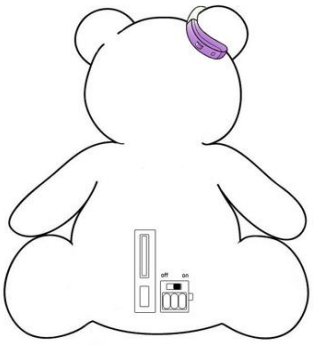


Figure 2. The posterior view, with the location of the memory card, battery, and USB port

The speech-language pathology button allows SLPs to access information about the client’s most recent achievement levels, and SLPs can set and edit levels using the “We Teddy” software, which offers predefined levels of AR (e.g., level one, which includes detection of sounds and recognition of different environmental sounds). Lastly, “We Teddy” also has a memory card that saves all patient reports, data, and hearing aid/cochlear implant programming and includes a photograph of the ear showing the severity and type of hearing loss, which allows Auds to examine the type and severity of hearing loss manually.

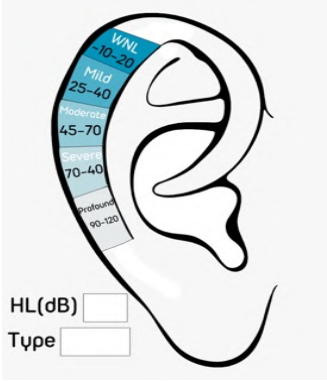


Figure 3. The included ear image to facilitate general diagnosis

The smaller size of “We Teddy” is made of fabric only and weighs less than the larger size so that the caregiver can easily carry it as a key chain. This smaller-sized model contains a simple memory card for data saving. This version of “We Teddy” connects with practitioners in three possible ways: (1) through a wireless Bluetooth connection, (2) through a wired connection via USB cable, or (3) through the insertion of a memory card into a computer. Moreover, the practitioner can transfer information back to the caregiver via

the memory card. This exchange of information allows "We Teddy" to facilitate necessary communication between practitioners while helping caregivers implement successful treatment plans for clients.

Results

The "We Teddy" device provides a convenient way for practitioners, caregivers, and clients to stay connected. Once data is stored and processed in the device, users may access this data via one of the three buttons shown in Figure 1, allowing for aural playback of the desired information.

Discussion and conclusion

In the fields of speech-language pathology and audiology, practitioners require easy access to each other and caregivers to provide coordinated and updated client care. However, SLPs and Auds currently lack this ability to collaborate due to the unavailability of a system that provides direct communication. The "We Teddy" device offers an assistive and effective method of communication between hearing-impaired clients, health care providers, and caregivers. "We Teddy" allows a variety of practitioners to be concurrently aware of the client's long-term progress while allowing the caregiver to express concerns, ideas, and needs about the treatment plan to a multidisciplinary team. Furthermore, "We Teddy" uses simple components, such as pushbuttons, voltage regulators, and an RF module, creating a cost-effective solution to a long-standing need.

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