Alternative forms of Communication in Adults who are living with Developmental Disabilities and are Deaf, Hard-of hearing and use Non-traditional forms of Communication: A Scoping Review

Includes:

Final Report

By: Nirja Satra

Completed for: Deafblind Ontario Services

Supervising Professor: Sebastien Paquette

Trent Community Research Centre Project Coordinator: Malaura Lucas

Course Code: PSYC 3901H

Course Name: Reading Course

Completion Date: April 21, 2025

Project ID: 6237

Trent Community Research Centre

Suite 3.10, Trent University Student Centre

1600 West Bank Drive

Peterborough, ON K9L 0G2

Phone: (705) 748-1093

Email: tcrc@trentu.ca

Website: trentu.ca/tcrc

Alternative forms of Communication in Adults who are living with Developmental Disabilities and are Deaf, Hard-of-hearing and use Non-traditional forms of Communication: A Scoping Review.

Authors:

Nirja Satra

Trent University and DeafBlind Ontario Services

nirjasatra@trentu.ca

Abstract:

The purpose of this scoping review is to increase awareness of the special difficulties experienced by persons who have both developmental impairments and concurrent deafness, a group whose communication requirements are complicated and frequently disregarded. There is a knowledge gap about efficient ways to communicate for adults within this dual-context population because the majority of existing research centres on either developmental disorders or sensory loss alone, or on children. In order to improve accessibility and diversity, the review investigates alternate forms of communication that are employed in both home and professional contexts. Research completed in North America or Europe, published within the last 15 years, and focusing on persons with both developmental impairments and some type of deafness was eligible for inclusion. It is important to note that papers focusing on deafblind individuals with developmental impairments was also considered, due to the limited data on only deaf individuals with developmental impairments. Descriptive cross-sectional studies, case series, individual case reports, and descriptive observational studies were among the designs that qualified. In addition to grey literature and reference list searches, a thorough search was carried out throughout the Google Scholar, APA PsychInfo, and Web of Science databases. Dr. Sebastien Paquette evaluated the search strategy after it was created in collaboration with a librarian. The review systematically finds and synthesizes research on alternate communication strategies using the PRISMA-ScR methodology. In addition to promoting improved accessibility and comprehension of this distinct group, the findings emphasize important communication tactics for a variety of contexts and provide insightful information to guide future study, policy, and practice.

Introduction:

People with developmental disabilities who are Deaf, hard of hearing, or use non-traditional communication methods face significant and complex communication challenges that affect their participation and engagement in a variety of contexts, such as the home, workplace, and healthcare settings. Existing research emphasizes the ongoing obstacles and restricted

accessibility that this community faces, despite the fact that their particular communication demands warrant specific approaches to promote productive connections (Fellinger et al., 2022).

These obstacles to communication have a significant impact on the social, emotional, and cognitive development of many people who are deaf or have serious hearing impairments. This is especially true for people who have prelingual deafness, which can impede the trajectory of development in ways that persist into adulthood because it occurs prior to language acquisition (Fellinger et al., 2022). Additional disabilities, including attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), dual-sensory impairments like deaf-blindness, intellectual disabilities (ID), and other neurological diseases, affect about 33-50% of prelingually Deaf people. In everyday life, social situations, and mental health contexts, these co-occurring disorders frequently result in a more complex interplay of communication difficulties, requiring specialized care (Fellinger et al., 2022).

The variety of linguistic modalities accessible to Deaf people with developmental impairments is one of the main factors affecting the quality of their communication. Spoken language, manual alphabets, traditional sign languages, and alternative techniques like Tadoma and Finger Braille are among the available language possibilities (Hersh, 2013). Different degrees of involvement, dependence on sensory input, and frequently different skill sets are necessary for each modality. For example, a high degree of touch-based understanding is included in the deafblind manual alphabet and tactile sign languages, where people comprehend signs by feeling the movements of their communication partner (Hersh, 2013).

Communication partners must receive extensive training in order to engage in meaningful exchanges that respect the unique preferences and abilities of individuals with congenital deaf-blindness and intellectual disabilities. This training often involves intensive interaction and a comprehension of subtle, occasionally unconventional, communicative signals (Bloeming-Wolbrink et al., 2014). Interactions for this demographic are made more difficult in many contexts by the absence of suitable equipment, skilled staff, and technologies, particularly in hospital and work sectors.

The significant communication challenges that people with developmental impairments and Deafness face are particularly noticeable in healthcare settings. Clear, accurate, and prompt communication is essential in healthcare settings, but people with complex disabilities or hearing impairments usually do not receive the proper accommodations for communication. According to Bruce et al., (2016) these people sometimes must depend on family members to interpret for them, which restricts their privacy and autonomy when it comes to managing their health. There is a chance of misinterpreting important medical information or getting the wrong care in the absence of professional communication assistance. Since social isolation and misunderstandings make Deaf people with intellectual disabilities more vulnerable, communication problems can also make mental health issues worse (Fellinger et al., 2021).

While communication tactics are equally important in the workplace, they frequently fail to meet the needs of employees who are Deaf or developmentally challenged. According to research, Deaf people have both structural and attitude challenges in the workplace, such as biases that prevent them from obtaining employment chances and inaccessible communication technologies (Alnfiai et al., 2024). The employment rates and professional

advancement of Deaf people with developmental disabilities are significantly impacted by this. According to research, Deaf people regularly face job discrimination because of their hearing levels, despite legal protections such those offered by the Ontario Human Rights Code (Ontario Deaf and Hard of Hearing Youth, 2016). The lack of assistance and inclusion in the workplace is made worse by restricted access to signed or visual communication.

Communication techniques are becoming more widely acknowledged as being essential to enhancing the psychological well-being and social inclusion of Deaf people with developmental disabilities in both educational and therapeutic residential facilities. By emphasizing social interaction and accessible visual communication, programs such as the therapeutic living communities, which are tailored for Deaf persons with intellectual disabilities, demonstrate encouraging results (Fellinger et al., 2021). Over time, these settings enable residents to cultivate self-care abilities, social awareness, and adaptive behaviours, underscoring the need of a communication-centered strategy (Fellinger et al., 2020). But as Bruce et al. (2016) point out, this population's heterogeneity calls for more study and specialized interventions to meet a range of communication demands.

Communication techniques for Deaf people with developmental impairments are still lacking, despite some advancements, especially when it comes to meeting a variety of requirements in various life contexts. For instance, as noted in Hersh's (2013) research, Deafblind people frequently lack the tools and assistance necessary to maintain the degree of communication required to preserve their independence, which further isolates them from participation in the community. The establishment of tactile-based or body-assisted forms of language, which has been demonstrated to promote greater connection and understanding in care environments, are examples of strategies to improve their communication abilities that should take into account their particular needs (Bloeming-Wolbrink et al., 2014; Weber et al., 2021). In contrast, there is greater opportunity for flexible, tailored communication techniques in home environments, where people are constantly surrounded by familiar family members who understand unique requirements and abilities of the Deaf person (Deasy et al., n.d.).

The review highlights that improving the quality of life for Deaf people with developmental disabilities requires the efficient application of communication techniques in the home, business, and healthcare settings. Nonetheless, there continues to be a lack of easily available communication tools and knowledgeable assistance in these situations. A multidimensional strategy that takes into account the unique language and sensory needs of this community is needed to address these issues. This strategy should include education, employment regulations, therapeutic support, and the advancement of social inclusion legislation. These tactics and their effects on the lives of Deaf and developmentally impaired people will be further examined in the parts that follow. This will highlight the necessity of comprehensive, inclusive approaches to communication support in all areas of everyday life.

Methods:

A scoping review following the PRISMA-ScR guidelines was conducted in order to determine and categorize the communication methods and resources that adults with developmental impairments and deafness employ in various settings. Following these guidelines, the author used the research question provided by DeafBlind Ontario Services,

identified relevant articles, selected relevant data, extracted the data and lastly summarized and discussed the data.

Identifying initial research questions:

Identifying and classifying the communication methods employed by persons with developmental impairments and deafness in many settings is the main goal of this review. It also looks at how language loss affects how well other forms of communication work. By highlighting strategies for improved communication assistance from caregivers and healthcare professionals, the review also seeks to fill in gaps in the literature.

1) What forms of communication do people with developmental disabilities who are also Deaf, hard of hearing, or use non-traditional forms of communication employ at home, at work, and in healthcare settings, and how does language deprivation affect the efficacy of these forms of communication?

Identifying relevant articles:

After conducting initial searches, the goal was to find all research on communication strategies for persons with developmental disabilities who are Deaf, hard of hearing, or non-traditionally communicative in contexts such as homes, workplaces, and healthcare facilities. A thorough search was done in Web of Science, APA PsychInfo, and Google Scholar. We also investigated grey literature sources, such as pertinent government publications, theses, and conference proceedings. A librarian assisted in the development and refinement of the search phrases, which included keyword combinations including "developmental disability," "Deaf," "hard of hearing," "non-verbal communication," "language deprivation," "alternative communication," and "healthcare communication."

Study Selection:

Articles were included in the first screening of titles and abstracts if they satisfied the following requirements: (1) concentrated on adults with both developmental disabilities and deafness or hearing impairments. ; (2) investigated verbal, non-verbal, bilingual, or alternative communication systems; (3) addressed communication in healthcare, workplace, or home settings; (4) investigated the effects of language deprivation on communication (5) were written in English; and Articles were included in the full-text screening process if they met the following criteria: (1) were released within the previous 15 years; (2) included studies carried out in healthcare, workplace, or residential settings; and (3) employed peer-reviewed research designs like case studies, reviews, or mixed-methods approaches. Articles that were written in languages other than English, had children as their target focus, or did not particularly target communication among adults who are deaf or have hearing issues in addition to developmental disabilities, were excluded. It is important to note that papers focusing on deafblind individuals with developmental impairments was also considered, due to the limited data on only deaf individuals with developmental impairments. The author went through three databases: APA PsychInfo, Google Scholar and Web of Science. The author initially identified 3315 articles across all the databases, out of which 2867 were left after omitting duplicates. 2855 articles were not relevant to the study for the following reasons: (i) did not include both developmental disability and deafness (ii) focused on students/children (iii) were not geographically conducted from North America or Europe. 12 articles were left that correctly met all the criteria.

Data Extraction: Table 1

Covidence No.	Title of Article	Author, Year	Location	Study Population	Data Collection Methods	Participants
1	Deafblind People, Communication, Independence, And Isolation	Hersh, 2013	UK, Czech Republic, Poland, 3 others	28 deafblind individuals, 1 caregiver	Semistructured interviews	28 (14M, 14F)
2	Communicative Deficits and Maladaptive Behavior	Fellinger et al., 2022	Austria, Spain	Deaf or hard-of-hearing with intellectual/psychiatric disabilities	Interviews, assessments	61 (39M, 22F)
3	Effects of Changes on Interaction and Communication	Bloeming-Wolbrink, 2015	Netherlands	Congenital deafblindness, intellectual disability (37–48 years)	Video recordings, file reviews	6 (4M, 2F)
4	Emotional Functioning and Language Use in Deaf Adults	Peñacoba et al., 2019	Madrid, Spain	146 deaf, 146 hearing (17–66 years)	Self-report measures	292 (62M, 84F deaf; 51M, 95F hearing)
5	Factor Analysis of Deaf Persons Communication	Salkić et al., 2018	Sarajevo, Bosnia and Herzegovina	80 deaf	Questionnaire	80 (sex not specified)
6	Development Of A Social Communication Questionnaire For People With Intellectual Disability In A Deaf Sample: A Pilot And Feasibility Study	Weber et al., 2021	Austria, Spain	Adults with ID (intellectual disabilities) and deafness.	Questionnaire completed by caregivers	62 (64% male)
7	Development Of Deaf Adults With Intellectual Disability In A Therapeutic Living Community	Fellinger et al., 2020	Lebenswelt Schenkenfelden (LWS), Austria	Adults with intellectual disabilities	Functional Skills Screening Inventory (FSSI)+Qualitative observations	8 (4M, 4F)
8	Effects of an Intervention Program on Interaction and Bodily Emotional Traces in Adults with Congenital Deafblindness and an Intellectual Disability	Bloeming-Wolbrink et al., 2023	Netherlands	Adults with congenital deafblindness (CDB) and an intellectual disability (ID)	Video recordings+ focus group discussions	5 (4M, 1F)
9	Potential For Communication In Individuals Who Are Congenitally Deafblind: It'S In The Eye Of The Beholder	Kathleen Deasy & Fiona Lyddy, 2009	National University of Ireland, Maynooth	Individuals who are congenitally deafblind	Case examples+ observational methods	N/A
10	The Use of a Behavior Chain Interruption Strategy to Teach Mands for Help with an Adult with Intellectual Disability and Deaf-Blindness	Hannah E. Thompson and Robbie J. Hanson, 2024	Adult residential facility (ARF) where the participant resided	65-year-old Caucasian male diagnosed with severe intellectual disability and bilateral deaf-blindness	Direct observation	1 (M)
11	Social And Communication Apps For The Deaf	Mrim Alnfiai, Srini	Dalhousie University, Canada	Deaf and hearing-impaired individuals	Literature review+ app evaluation + and user feedback analysis	N/A

	And Hearing Impaired	Sampali, 2017				
12	Therapeutic Living Communities For Adults Who Are Deaf And Have Intellectual Disabilities: A Conceptual Model Linking Social Communication And Mental Health	Fellinger et al., 2021.	Austria, Spain.	Adults who are deaf and have intellectual disabilities (ID), specifically those with profound hearing loss and varying levels of ID, including some with additional disabilities such as epilepsy and cerebral palsy.	Qualitative + quantitative data collected from therapeutic living communities.	70

Data Extraction: Table 2

Covidence No.	Title of Article	Communication Methods	Significant Findings	Recommendations
1	Deafblind People, Communication, Independence, And Isolation	Spoken, sign, tactile sign, manual alphabets	Barriers to communication caused isolation and depression; desire to engage in society.	Train professionals, improve support, encourage independence.
2	Communicative Deficits and Maladaptive Behavior	Visual communication (sign language)	Better communication = lower maladaptive behavior.	Promote communication skills.
3	Effects of Changes on Interaction and Communication	Tactile signs, non-verbal communication	Improved interaction and communication.	Train caregivers.
4	Emotional Functioning and Language Use in Deaf Adults	Spanish oral/sign language	Higher alexithymia, lower relationships in deaf participants.	Address alexithymia, improve communication methods.
5	Factor Analysis of Deaf Persons Communication	Verbal, non-verbal, and bilingual communication systems among deaf individuals	Preference for non-verbal communication and positive attitude to all communication methods	Understand communication preferences.
6	Development Of A Social Communication Questionnaire For People With Intellectual Disability In A Deaf Sample: A Pilot And Feasibility Study	Minimally verbal, using both signed and spoken communication	Correlations between social communication skills and language, social skills, and autism spectrum disorder (ASD) severity	QSC-ID in populations with typical hearing is recommended
7	Development Of Deaf Adults With Intellectual Disability In A Therapeutic Living Community	Sign Language	Increases in social awareness and community living skills among participants	importance of a therapeutic milieu that supports visual communication and social relationships for deaf individuals.
8	Effects of an Intervention Program on Interaction and Bodily Emotional Traces in Adults with Congenital Deafblindness and an Intellectual Disability	Bodily emotional traces (BETs)	Intervention program led to an increase in the quality of interaction and the recognition of expressions based on BETs	Extending BET training for caregivers
9	Potential For Communication In Individuals Who Are Congenitally Deafblind: It'S In The Eye Of The Beholder	Formal sign language, tactile signing, adaptive signs, and natural gestures	Communication in congenitally deafblind individuals is largely dependent on the recognition of their communicative attempts.	Communication strategies should be tailored to the individual needs of deafblind persons.
10	The Use of a Behavior Chain Interruption Strategy to Teach Mands for Help with an Adult with Intellectual Disability and Deaf-Blindness	Unspecified tactile prompts and adapted American Sign Language (ASL)	Participant used the device independently during establishing operation (EO) trials and never used it during abolishing operation (AO) trials, indicating effective manding for help	Assess the function of device usage, participant preferences for communication options.
11	Social And Communication Apps For The Deaf And Hearing Impaired	Sign language, text messaging, and video communication	Significant lack of communication apps that meet the needs of deaf individuals	Developers focus on creating apps that incorporate features such as real-time communication, speech-to-text capabilities

12	Therapeutic Living Communities For Adults Who Are Deaf And Have Intellectual Disabilities: A Conceptual Model Linking Social Communication And Mental Health	Austrian Sign Language	Social communication skills significantly impact mental health outcomes for deaf individuals with ID.	Replicating the model of care for deaf individuals with ID

Ethical Considerations:

Since this review is based on the collection of data from articles, formal ethical approval was not required, as primary data was not be collected in this study.

Results

The results of this scoping review are presented in Table 1 (Study and Participant characteristics) and Table 2 (Intervention characteristics and Outcomes).

According to Fellinger et al. (2022), there were notable deficiencies in adaptive skills and communication among participants with developmental disabilities. With a mean index score of 18.07 (SD = 2.59) for maladaptive behaviour, 41% of subjects scored ≥18, and 18% achieved clinically relevant levels (scores 21–24). The results of the adaptive skill evaluation showed significant deficiencies in social skills (mean = 35.32) and everyday life skills (mean = 41.3), but strengths in motor skills (mean = 62.46). With a mean reference age of 3.51 years for language comprehension and 6.23 years for non-verbal cognitive functioning, the revised RDLS-III assessment of language comprehension revealed significant deficiencies. Participants showed considerable deficiencies in prosocial language use, but they were able to construct short sentences with basic grammar in terms of expressive and receptive language. Correlations showed that social skills ($r = -0.272$, $p < 0.05$) and linguistic skills, specifically the CDI score ($r = -0.405$, $p < 0.001$), were substantially correlated with maladaptive behaviour. Similarly, participants who were severely deaf and had an average IQ of 64 showed varying levels of communication development, according to Fellinger et al. (2020). Despite having a challenging developmental history, one participant demonstrated significant progress in communicating, especially in learning sign language, in a nurturing setting.

Communication tactics for deafblind people need to be highly customized and frequently change over time, according to Hersh (2013). As an illustration of how personal needs affect communication styles, JG, a deafblind and autistic person, showed a propensity for social interaction—but only in moderation. Individuals from hearing families frequently used spoken language, augmented by lipreading or tactile techniques when vision and hearing deteriorated, but Deafblind people from Deaf households tended to prefer sign language. when seen by participants like AR and FS, who switched from visual sign language to tactile when their vision worsened, flexibility was essential in communication.

Numerous research shown how participants' communication abilities improved over time. All participants showed improvements in communication, with some exhibiting gains ranging from 12.5% to 83.3%, according to Bloeming-Wolbrink et al. (2023). The majority of participants saw an increase in caregiver attention, although participant attention varied,

yielding inconsistent outcomes. Participants 2 and 5, for instance, demonstrated notable gains improved caregiver attention, despite participant 5's scores rising even more throughout the follow-up period. In Phase II and follow-up, participant 2 did, however, exhibit a minor deterioration. Tina, one participant, advanced from being unable to request objects to using gestures to do so in terms of communication functions. George made progress in social interactions, such as displaying affection, underscoring the value of intervention techniques and caregiver participation in promoting communicative development.

Furthermore, Weber et al. (2021) discovered that individuals in the "borderline SC" group, that had significant cognitive and language developmental impairments, were nonetheless able to communicate socially. Additionally, the female participant from this group demonstrated excellent nonverbal communication skills with caregivers and was able to successfully start conversations when necessary. In contrast, male participants were more likely to initiate communication but struggled to maintain two-way interactions.

People who are deaf or have developmental impairments can communicate better thanks to technological treatments. The usage of a tool for communication was investigated by Thompson et al. (2024), who found that during the intervention period, the participant's independent utilization of the device grew dramatically. For instance, the person showed 56% independence when using the device during meals scenarios and 74% independence when using it for restroom duties. Mealtime tasks demonstrated 88% independence at the treatment extension period, whereas dressing and restroom duties reached 100% independence. The participant did not, however, utilize the gadget for every task, especially while engaging in activities that were not part of the predetermined scenarios.

This implies that although technology can help in communication, how well it works may vary depending on the situation. There aren't many mobile applications that completely address the communication demands of deaf people, according to Alnfiai et al. (2017) and Fellinger et al. (2021). Although no single app provides every functionality that is required, six apps were found to have the most beneficial features. In real time communication, privacy protection, speech-to-text capabilities, huge letter sizes for usability, and multilingual support were among these characteristics. While programs like Visual Hear It and Let Me Hear Again offer comparable functions, such as video calls, text-to-speech, and sound-to-text conversion, Glide-Video Chat Messenger, for instance, has ten of the thirteen desirable characteristics.

Involving caregivers is essential to helping people with developmental impairments improve their communication abilities. Bloeming-Wolbrink et al. (2023) showed that participants' communication skills development was greatly impacted by the attention and involvement of their caregivers. As the intervention went on, caregiver confirmation as well as affective participation also increased, and caregiver attention increased with time, especially for patients with lower baseline scores. Improvements in social interactions and request-making, among other communication tasks, were associated with these characteristics. In a similar vein, Fellinger et al. (2022) found that caregivers were crucial to participants' communication growth, assisting with the construction and expression of simple sentences even when there were severe communication impairments.

When Penacoba et al. (2019) looked into how language use affected deaf people's emotional outcomes, they found that people who used both spoken and signed languages (SSL and SOL) tended to have better emotional concentration and repair abilities. Deaf participants

stated that they used SOL at work or at home and SSL with friends, with context-based differences in preferred language. While individuals who relied mostly on spoken language showed stronger favourable interactions, participants who utilized either language scored higher on emotional characteristics. It's interesting to note that people with SSL as their first language showed greater emotional language deficiencies than people without SSL, indicating a complicated link between language use as well as emotional consequences. This research emphasizes the necessity of customized communication tactics that take emotional growth and language usage into account.

A desire towards bilingualism in communication was found in a factor analysis of deaf participants, with many of them expressing a preference for both spoken and signed languages. Despite this inclination, several participants said they felt uncomfortable using spoken language because they found it challenging and even "unacceptable" in specific situations (Factor of multilingual orientation). Despite the fact that many deaf persons interacted with both hearing and deaf people, they observed a propensity for communication encounters to be segregated, which they labelled the "Factor of segregation approach." This implies that although bilingual communication techniques are helpful, there are still issues with integrating the hearing and deaf communities in an approach that promotes equal participation.

Discussion

The results of this scoping review demonstrate how important communication is for people with developmental disabilities, especially those whom are additionally Deaf or hard of hearing, within a variety of contexts, such as the workplace, the family, and the medical field. The review highlights both the difficulties caused by language deprivation and the important influence that communication availability has on social engagement, mental health, and adaptive behaviour.

Numerous studies have shown a correlation between a rise in maladaptive behaviours and communication difficulties in people with hearing loss and intellectual impairments (ID). For example, Fellinger et al. (2022) observed that although communication problems were apparent, there was no significant correlation between maladaptive behaviours and intellectual functioning. Rather, behavioural outcomes seemed to be more significantly influenced by communicative functioning. In particular, individuals with significant communication problems showed increased maladaptive behaviours, which are frequently made worse by linguistic delays in sign language, even though they lived in contexts designed for visual communication (Fellinger et al., 2022). This result is in line with that of Fellinger et al. (2020), who noted improvements in social awareness and adaptive behaviour after regular sign language use was introduced; nevertheless, more controlled research was required to confirm the findings.

Hersh (2013) further examined the function of accessibility and communication assistance, emphasizing the significance of removing the infrastructure and attitude barriers that prevent deafblind people from communicating effectively. According to Hersh (2013), these people usually experience loneliness and sadness as a result of inadequate communication assistance, and in order to get past these obstacles, they commonly need combined formal training and unofficial social networks. Bloeming-Wolbrink et al. (2015) provided more support for the

idea that effective communication techniques are necessary. Their research demonstrated that structured care settings with skilled personnel improved participant communication behaviors and caregiver attentiveness. However, the authors pointed out that the variation in caregiver responses raises the possibility that more assistance and training are required to maximize communication results.

According to Penacoba et al. (2020), there is a notable incidence of alexithymia amongst deaf participants, which is associated with higher levels of anxiety and depression when it comes to emotional regulation and communication. Bilingual communication may improve emotional regulation in this population, as evidenced by the intriguing findings that individuals who used combined spoken and sign languages had superior emotional concentration as well as emotional repair. This research supports the notion that language and communication style are important for social interaction as well as emotional and psychological health.

Additionally, Deasy et al. (2009)'s findings emphasized the significance of identifying non-traditional communication actions, which at first glance may seem pointless but are actually crucial for engagement. The study underlined how important it is for professionals and caregivers to respect each person's individual communicative cues and approach interactions with an open mind. This was supported by Salkic et al. (2018), who discovered that deaf people frequently favour nonverbal communication, especially through sign language, and emphasized the difficulties they encounter while attempting to use spoken language, even though they have a positive outlook on all kinds of communication.

People with hearing loss can communicate more easily thanks in large part to technology. The use of communication apps was examined by Alnfiai et al. (2017), who suggested that although existing apps meet certain objectives, such real-time communication, they fall short in supporting emotional regulation or addressing environmental issues (like noisy environments). According to the study, integrating elements like tactile or visual alerts and sign language assistance could help deaf people find employment by lowering anxiety and enhancing social connectivity.

According to Fellinger et al. (2021), social communication abilities are essential for the mental well-being of people with ID and hearing loss. According to their research, people who have exposure to social communication networks—especially those that use sign language—had higher levels of social engagement, which is strongly associated with better mental health outcomes. These results highlight the necessity of interventions aimed at improving social communication abilities in order to promote these populations' general well-being.

Weber et al. (2021) investigated the usefulness of the QSC-ID questionnaire, which evaluates social communication practices among persons with ID and deafness, in terms of intervention effectiveness. According to the study, communication outcomes were impacted by contextual factors including the organized work environment. This underscores the necessity of customized therapies that take into account the environment of the individual and their unique communication issues.

Lastly, the significance of tailored interventions was underlined by the Thompson et al. (2024) study on the usage of assistive technologies for help requests. In order to make sure

that these tools are useful and socially acceptable, the study emphasized the need for more research on participant preferences, long-term efficacy, and device functionality, even if the participant utilized the device well throughout organized sessions.

When taken as a whole, these studies highlight how crucial accessible communication is to helping people with hearing loss and developmental impairments achieve better results. They demonstrate that a one-size-fits-all strategy is inadequate and that customized interventions—whether via sign language, technology assistance, or the modification of caregiving settings—are essential for meeting the various communication demands of this demographic. The effects of language deprivation, especially with regard to social communication, emotional control, and adaptive behaviour, highlight the necessity of ongoing study and the creation of methods to enhance communication in a variety of contexts.

Conclusion

For those with developmental impairments who are Deaf, hard of hearing, or use non-traditional ways of communication, this scoping review underlines the complex function of communication. Accessible communication is found to be essential for fostering adaptive behaviours, emotional health, and social interaction in a variety of contexts, such as the workplace, family, and healthcare. The significant effects of language loss on communication effectiveness and related behavioural and psychological consequences are highlighted by important results. Rather than cognitive impairments, maladaptive behaviours and difficulties with emotional regulation were frequently associated with communication problems, highlighting the significance of customized interventions including bilingual communication techniques and sign language instruction. Furthermore, communication outcomes were greatly enhanced by the combination of assistive technology and caregiver involvement; yet, response variability suggests that customized strategies are required. Furthermore, the research show that in order to meet the special demands of people with dual sensory impairments, non-traditional communication techniques like tactile or augmented systems are essential. Interventions emphasizing accessibility and customisation generally improved social integration, emotional well-being, and adaptive performance. These results highlight the need for more investigation and creativity to fill in the ongoing gaps in this population's communication support. In particular, it is imperative to create all-encompassing instruments and interventions that honour personal preferences and adjust to changing requirements. Stakeholders can help people with developmental disabilities who suffer from hearing loss or language deprivation live better lives and participate more fully in society by creating inclusive communication environments.

Patient consent for publication: Not required.

Contributors: DeafBlind Ontario Services conceived the idea for the review, which was then included as a topic in Trent University’s Community Based Research Program. NS was the chief contributor; however, all stages of this project were overlooked by Dr Sebastien Paquette. DeafBlind Ontario Services also arranged meetings to facilitate any questions or concerns.

Funding: This project did not need funding.

Competing interests: None declared.

Acknowledgments

I wish to thank Dr Sebastien Paquette for his input and help in overlooking the entire project; DeafBlind Ontario Services' staff for its aid in allowing me a chance to meet with their community, attend community events, use their resources and its community members for being welcoming and patient with me; lastly, Trent University for coordinating this entire project.

References

Alnfiai, M., Sampali, S., & Department of Computer Science, Dalhousie University. (2024). *Social and communication apps for the deaf and hearing impaired* [Journal-article].

Bloeming-Wolbrink, K. A. B., Janssen, M. J., Ruijssenaars, W. A. J. J. M. R., & Riksen-Walraven, J. M. R. (2022). Effects of an intervention program on interaction and bodily emotional traces in adults with congenital deafblindness and an intellectual disability. *Journal of Deafblind Studies on Communication, Vol. 4*, 39–66.

Bloeming-Wolbrink, K. A., Janssen, M. J., Ruijssenaars, W. A., Menke, R., & Riksen-Walraven, J. M. (2014). Effects of changes in life circumstances on interaction and communication in adults with congenital deafblindness and an intellectual disability. *British Journal of Visual Impairment*, *33*(1), 31–44. https://doi.org/10.1177/0264619614558429

Bruce, S. M., Nelson, C., Perez, A., Stutzman, B., & Barnhill, B. A. (2016). The state of Research on Communication and Literacy in deafblindness. *American Annals of the Deaf*, *161*(4), 424–443. https://doi.org/10.1353/aad.2016.0035

Deasy, K., & Lyddy, F. (n.d.). Potential for communication in individuals who are congenitally deafblind: it's in the eye of the beholder. In *The Irish Psychologist* [Journal-article].

Fellinger, J., Dall, M., & Holzinger, D. (2021). Therapeutic living communities for adults who are deaf and have intellectual disabilities: A conceptual model linking social

communication and mental health. *International Journal of Developmental Disabilities*, *67*(5), 391–396. https://doi.org/10.1080/20473869.2021.1953938

Fellinger, J., Dall, M., Weber, C., & Holzinger, D. (2022). Communicative deficits associated with maladaptive behavior in individuals with deafness and special needs. *Frontiers in Psychiatry*, *13*. https://doi.org/10.3389/fpsyt.2022.944719

Fellinger, J., Linzner, D., Holzinger, D., Dall, M., Fellinger, M., & Fogler, J. (2020). Development of Deaf Adults with Intellectual Disability in a Therapeutic Living Community. *The Journal of Deaf Studies and Deaf Education*, *25*(3), 261–269. https://doi.org/10.1093/deafed/enz056

Hall, M. L., Hall, W. C., & Caselli, N. K. (2019). Deaf children need language, not (just) speech. *First Language*, *39*(4), 367–395. https://doi.org/10.1177/0142723719834102

Hersh, M. (2013). Deafblind people, communication, independence, and isolation. *The Journal of Deaf Studies and Deaf Education*, *18*(4), 446–463. https://doi.org/10.1093/deafed/ent022

Ontario Deaf Youth Collective. (2022). *Deaf and Hard of hearing youth in Ontario: A snapshot of systemic barriers and gaps*. https://silentvoice.ca/wp-content/uploads/2022/09/Deaf-and-Hard-of-Hearing-Youth-in-Ontario-_A-Snapshot-of-Systemic-Barriers-and-Gaps.pdf

Peñacoba, C., Garvi, D., Gómez, L., & Álvarez, A. (2019). Emotional functioning, positive relationships, and language use in deaf adults. *The Journal of Deaf Studies and Deaf Education*, *25*(1), 22–32. https://doi.org/10.1093/deafed/enz034

Salkić, N., Švraka, E., & Povlakić Hadžiefendić, M. (2018). Factor analysis of deaf Persons communication. *World Journal of Research and Review (WJRR)*, 21–26. https://www.researchgate.net/publication/359146348

Thompson, H. E., & Hanson, R. J. (2024). The Use of a Behavior Chain Interruption Strategy to Teach Mands for Help with an Adult with Intellectual Disability and Deaf-Blindness. *The Analysis of Verbal Behavior*. https://doi.org/10.1007/s40616-024-00204-8

Van Naarden Braun, Gallaudet Research Institute, Bronfenbrenner, U., & United Nations. (2023). *Position Paper on the Social Inclusion of Deaf People with Intellectual Disabilities* [Position Paper].

Weber, C., Weber, C., Fellinger, J., & Holzinger, D. (2021). Development of a Social Communication Questionnaire (QSC-ID) for people with intellectual disability in a deaf sample: A pilot and feasibility study. *Frontiers in Psychiatry*, *12*. https://doi.org/10.3389/fpsyt.2021.755993