Journal of Health Care Communications
ISSN: 2472-1654

Open access Case Report

Sign Language Integration in Dental Education: A Qualitative Case Study

Grace M. Phelan[1*], Elizabeth W. Ayers[1,2]

[1]Deaf Health Care and Biomedical Sciences Hub, National Technical Institute for the Deaf, Rochester Institute of Technology, United States

[2]Department of Science and Mathematics, National Technical Institute for the Deaf, United States

ABSTRACT

Objectives: There exists many communication barriers for Deaf and Hard of Hearing (DHH) patients receiving dental care. Providers can address this inequity and offer better care by using sign language. However, there are few instances of sign language or deaf culture courses in dental school curriculums. Only one unique curriculum at The University of the West Indies (UWI) dental school, Mona Jamaica, includes mandatory courses in sign language and deaf culture as well as clinical application of sign language. This study is intended to investigate this curriculum, determine the effectiveness of sign language training for dental students, and assess the longevity of its impacts.

Methods: Performed in 2024, this study included a semi structured interview with a professor who contributed to development of the sign language program at UWI, and questionnaires completed by alumni of this program.

Results: Four alumni participated. Most revealed enjoyment of the courses, and a continued use of sign language after graduation, with some loss in proficiency. One alumnus revealed negative experiences and no retention of sign language. The outlying negative response is assumed to be due to disorganization in an early cohort, and limited patient interaction while pursuing a residency after graduation.

Conclusion: The loss of proficiency over time suggests a need for continued sign language education opportunities for dental professionals. The alumni also suggested improving the course by use of signing partners, online resources, and earlier implementation. Other dental schools may use this information to develop similar sign language curriculums.

Keywords: Communication; Cultural competency; Curriculum; Deafness; Dental care; Dental school; Hearing loss; Sign language

INTRODUCTION

Challenges Faced by DHH in Dental Offices

Many Deaf and Hard of Hearing (DHH) people experience communication barriers, which may result in socioeconomic and health disparities. One survey identified low health literacy as a crucial factor affecting the quality of dental care for DHH patients [1]. Low health literacy, combined with the repetitive and educational nature of dental treatment, poses communication challenges for those with hearing loss receiving dental care. Common challenges faced by DHH patients in dental offices include mask-related facial obstruction, background noise, and inadequate communication strategies by providers. For example, many hearing physicians expect their DHH patients to speech read, but are unaware that only 30% of spoken words can be accurately speech read [2]. Some general dentists refuse patients requiring special care due to their lack of knowledge and experience [3]. The Americans with Disabilities Act aims to ease these struggles by requiring providers to make accommodations as long as they do not pose an undue burden, and in that case, to provide alternative accommodations [4]. However, these accommodations are not always present, and do not always meet the needs of DHH patients. Additionally, certain regions outside the United States, such as the Caribbean, lack laws mandating communication

Received:	07-June-2024	**Manuscript No:**	IPJHCC-24-20408
Editor assigned:	10-June-2024	**PreQC No:**	IPJHCC-24-20408 (PQ)
Reviewed:	24-June-2024	**QC No:**	IPJHCC-24-20408
Revised:	01-July-2024	**Manuscript No:**	IPJHCC-24-20408 (R)
Published:	08-July-2024	**DOI:**	10.36846/2472-1654-9.3.9022

Corresponding author Grace M. Phelan, Deaf Health Care and Biomedical Sciences Hub, National Technical Institute for the Deaf, Rochester Institute of Technology, United States, E-mail: gmp6464@rit.edu

Citation Phelan GM, Ayers EW (2024) Sign Language Integration in Dental Education: A Qualitative Case Study. J Healthc Commun. 9:9022.

aids for DHH in healthcare settings [5].

Improving Care by Diversifying Healthcare

Many communication barriers stem from hearing providers' ignorance of appropriate communication methods and cultural awareness. DHH dentists can augment care, possessing comprehensive communication strategies and understanding of the deaf community's diverse needs. DHH dentists possess the necessary skills to excel in their field, yet a stark underrepresentation of DHH people in dentistry persists. We currently know there to be only five DHH dentists in the United States [6]. Phelan and Ayers' study Deaf Dentists Diversifying Healthcare investigated strategies applied and skills possessed by DHH dentists to promote increased representation of DHH individuals in dentistry. They found that DHH dentists augment patient care and inspire improvements in care among their hearing colleagues and classmates [6]. Therefore, hearing dentists possess the potential to learn better care strategies for DHH patients, but may be lacking in educational resources.

Lack of Sign Language Training in Dental Education

Current dental education curriculums lack integration of sign language or cultural competence when it comes to DHH. Jones and Cumberbatch revealed the scarcity of mandatory sign language programs in dental schools across North America, Europe, and Australia in their literature review. They mention an Introduction to Deafness course developed at Case Western Reserve University School of Dentistry, but it was never actually offered [7]. Another review by indicated that dental students at the University of Malaya received Disability Equity Training, enhancing knowledge of social discrimination, but not covering sign language [3]. Incorporating sign language alongside deaf culture is crucial. Some dentists reported feeling comfortable treating DHH patients with fluent speech abilities, but their comfort significantly decreased when treating non-speech sign language users [8]. This implies that the language barrier may have a greater impact than a lack of awareness regarding deafness. American dental school graduates perceived a deficiency in their education regarding sign language or deaf culture, with most dentists relying on information from friends and online sources to communicate with DHH patients [8]. This gap was also demonstrated in another review, where it was found that medical students possess a knowledge score below the 50th percentile regarding the health needs of the deaf community [9]. This highlights the inadequacy or absence of existing training on caring for DHH patients.

Expanding the literature review across all healthcare curricula reveals existing sign language courses with limitations. For example, an online extracurricular workshop on deaf awareness for medical students in Germany significantly increased their confidence in working with DHH patients [2]. Similarly, workshops on sign language and deaf awareness at Kirksville College of Osteopathic Medicine increased students' confidence, but provided only short-term knowledge [10]. The impacts of these courses are limited due to their brief duration and incomplete curriculum. Moreover, as elective courses, students' lack of awareness about communication needs among the DHH community may hinder their interest in participation [11].

At the University of Rochester School of Medicine, the Deaf Strong Hospital program introduces first-year students to sign language and deaf culture by immersing them in role-playing scenarios where they act as hearing patients communicating with DHH providers. While participants find the program beneficial for understanding cultural and communication challenges faced by DHH patients, its impact is limited as it occurs for one day at the start of training [12]. Recent research suggests that despite initial training, students may forget sign language knowledge over time, potentially affecting their ability to communicate effectively with DHH patients in clinical practice [8]. While some literature shows positive results, there is no evidence that this type of education provides students with lasting knowledge and skills. To address this issue, implementing Continuing Education (CE) opportunities could be beneficial. A study found that 45.9% of respondents expressed interest in CE courses focusing on treating DHH patients, with 69% of employers also supporting such courses [8].

Desire for Improved Sign Language Training

The literature review highlights a clear demand for increased sign language education within health education curricula. Hearing medical students participating in the Deaf Strong Hospital program expressed a desire to continue their training throughout medical school [12], while attendees of another sign language workshop similarly indicated a need for longer or multisession workshops [10].

Medical education organizations have outlined the values that students and future healthcare providers should embody, emphasizing inclusivity for DHH patients. For example, in Germany in 2015, the National Competence-Based Learning Objectives for Undergraduate Medical Education described the importance of medical students being able to adapt the medical setting to meet [DHH] patients' specific needs [2] The American Dental Education Association has also articulated similar values for their students and providers [3].

Furthermore, there is a pressing practical necessity for such skills. Patient demographics are shifting towards older, sicker, and more culturally diverse populations, resulting in increasingly complex dental needs [13]. This demands that oral health professionals possess the proficiency to manage advanced cases with precision. Additionally, recent trends indicate that many dental school graduates prefer employment over establishing private practices. By joining larger healthcare teams, dentists will encounter a broader spectrum of patient needs, necessitating increased awareness and capabilities [13].

Teaching sign language not only augments care for DHH patients but also enables students to apply what they learn to other disability or linguistic minority groups. Participants in the Deaf Strong Hospital program later utilized their understanding of interpreter etiquette and nonverbal communication methods with Spanish-speaking patients in their clinical practices [12].

This versatility is invaluable, considering the impossibility of covering every cultural minority in medical education.

Unique Course at UWI

Phelan and Ayers' recent research brought to light the sign language and deaf culture program at The University of the West Indies (UWI) Mona, Jamaica [6]. This intriguing discovery piqued our curiosity to explore further into this distinctive method of training dental students, which includes a comprehensive curriculum incorporating mandatory courses and clinical components. Developed and implemented exclusively at UWI in Jamaica, this program began in 2014. It entails two courses during the students' second year: A beginning Caribbean Sign Language course covering basic signing and grammatical constructs, and a Sign Language for Medicine and Dentistry course focusing on deaf culture and discipline-specific signing. All sign language courses are taught by trained interpreters. Subsequently, in their third year, students participate in a clinical component where they must demonstrate signing competency while performing procedures with DHH patients [5].

Goals of this Study

The goal of our investigation is to learn more about the lasting impacts of the UWI dental curriculum integrating sign language and deaf culture training. We seek to determine if this training continues to benefit providers and patients, both hearing and DHH, after completion. Additionally, we aim to gather insights for enhancing the program and offer a model for implementing similar initiatives in dental schools worldwide.

METHODS

Ethical Considerations

Ethical clearance was obtained from our Institutional Research Board. This study strictly adhered to the ethical standards of human experimentation and the Helsinki Declaration of 1964, as amended in 2013.

CASE PRESENTATION

We learned of the Professor's role in developing this course through their publications [5,7] and found their email listed on the UWI website. After receiving IRB clearance, we reached out via email directly to the Professor who was a key contributor to the development of the UWI program, requesting an interview to gain deeper insights into their curriculum. The Professor accepted our invitation, which was followed by a semi-structured interview via Zoom which was recorded to create a transcript in English text. Subsequently, the Professor distributed a participation invitation to a list of UWI's dental school alumni via email. Those interested contacted the researchers with the email address provided, and were then sent an electronic questionnaire. Four UWI dental alumni responded to the inquiry. Each received a written consent form along with the questionnaire. Identifying information was either removed or altered for confidentiality upon receipt of participant data. Responses were grouped by section and recorded as direct quotes. Quotes were also extracted from the Professor's interview transcript and grouped similarly. **Figure 1** illustrates inquiry methods applied for this study.

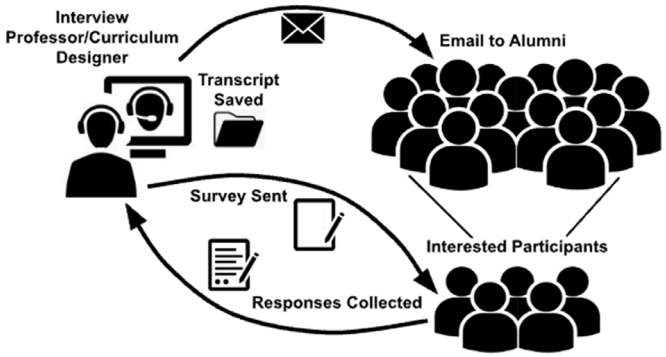

Figure 1: Visual representation of inquiry methods applied

Participants

We first gathered demographic information from participants, such as their tenure as a professor or student at UWI, their current position, and whether they had prior experience with DHH individuals. The Professor has been teaching at UWI since 2000, assumed coordination of the Caribbean Sign Language and Interpreting program in 2006, and created the Sign Language for Medical Healthcare program in 2014. They possess previous experience with DHH children at their school and DHH members of their church. Despite lacking formal certifications, they consider themselves a helper in the interpreting model. Helpers facilitate communication, but act more as a friend than a professional. Children of Deaf Adults (CODA) often find themselves in this role. Similarly, the Professor held this responsibility as a child interpreting their father's sermons. Some DHH welcome this form of interpreting, while others prefer the more popular bicultural-bilingual model, which emphasizes accurate information conveyance while allowing for self-advocacy [14].

The four participating UWI dental alumni graduated between 2018 and 2022. Three of them are currently still practicing in the Caribbean, with Alumni 1 and 4 remaining in Jamaica, while Alumnus 3 is pursuing a residency in orthodontics in Israel. None of the UWI alumni reported prior experience with the DHH community, although Alumnus 1 noted being aware of DHH due to proximity to a deaf school in their hometown. **Table 1** outlines participant demographics.

Table 1: Participant demographics

	Alumnus 1	Alumnus 2	Alumnus 3	Alumnus 4	Professor
Graduation year/ tenure	2022	2019	2018	2022	2000

Current position	I practice in May Pen, [Jamaica], in a private office. It's not as urban as Kingston but it is a high volume practice.	I'm working as a general dentist in Nassau, Bahamas.	I'm currently an orthodontic resident [in Israel]. Before that I worked as a general dentist in Kingston, Jamaica.	I work at a private dental office, [in Jamaica] as an Associate.	I am a Sr. Lecturer at UWI. Since 2006, I have been coordinating and delivering in the Caribbean Sign Language and interpreting program. And then, in 2014, we added sign language for medical health care.
Prior experience with DHH	I did not have prior experience with the deaf community but I was aware of a school in the town. I used to see students signing as they walked home.	No.	Nope.	No I did not. I actually didn't know we had such a large Deaf community until we were introduced to the course.	My primary school, uh, was mainstream. So I had deaf children in my class. And then my father was a pastor and got involved with a deaf missionary group.

Interview Structure

The interview and questionnaire were grouped into three different sections. The first set of questions delved into participants' experiences with the sign language curriculum. They were asked about its structure, how much they enjoyed it, and its relevance to their work. The second section centered on their success, retention of information, and continued use of sign language after graduation. The final section inquired about their ideas for improving the program or implementing similar programs elsewhere. These groupings allowed for a systematic exploration of various aspects related to the sign language curriculum and its impact on alumni's experiences and learning outcomes.

RESULTS

Theme 1: Experiences with UWI Sign Language for Medical Healthcare Curriculum

The Professor described the Sign Language for Medical Healthcare structure as follows: In the second year of the five-year dental program, preclinical students are taught introductory signing and grammatical structure. Subsequently, they learn discipline-specific signing and gain insights into deaf culture. Moving into the third year, clinical students shift their focus to patient care, where they are required to communicate in sign language for specific procedures. The Professor noted that many students initially hesitate to embrace sign language as they prioritize dental learning and don't specifically sign up for sign language courses. However, when faced with DHH patients during the clinical phase, they often realize the importance of being able to communicate in sign language.

Feedback from participating UWI dental alumni on the sign language courses varied. UWI Alumnus 2 expressed that they "thoroughly enjoyed" the courses, while Alumnus 1 found sign language to be challenging but still enjoyable to learn. Conversely, Alumnus 3 described the courses as very difficult, and "overbearing", particularly when combined with the heavy workload of dental school. However, they acknowledged significant improvement from their initial level of proficiency. Alumnus 4 appreciated learning about the history of deaf communities in the Caribbean, particularly when taught by DHH instructors. Despite differing opinions on the difficulty of the courses, all four UWI dental alumni enjoyed the clinical aspect as it provided practical skills relevant to dentistry, and offered valuable practice opportunities. **Table 2** summarizes participant reflections regarding their experience as a dental student.

Table 2: Participant quotes regarding experiences with the sign language curriculum

	Alumnus 1	Alumnus 2	Alumnus 3	Alumnus 4	Professor
Enjoyed learning sign language?	As a more academic than practical student, I enjoyed learning about sign language as a language and the culture of being deaf more than the classes geared towards actually signing.	I thoroughly enjoyed the sign language classes at UWI and found them to be very informative. While I did learn a lot, I wish there had been even more opportunities for learning.	I didn't enjoy them. Mainly because dental school had such a heavy workload, so anything beyond dentistry felt overbearing. The videos we had were not well organized (perhaps since it was the 1st or 2nd year of the sign language component).	I enjoyed some parts more than others. The tutorials with the Deaf instructors were definitely more interesting than the lectures. The history and background of the Deaf community not only in Jamaica but other Caribbean countries was interesting to learn.	We do have students who grumble, grumble straight through preclinical, when they start clinical, they grumble. And when they get into doing the specific procedures and the deaf person is in their chair, it hits them at that stage. So some of them are not happy about it until it's too late.

Difficulty of course content?	It was frustrating as it was harder to catch on initially for me, so it took a lot more practice than I at first wanted to commit to.	The course content wasn't difficult, and I particularly appreciated the practical aspect. I feel like it could've been more organized.	It was difficult because it was a completely foreign concept to me.	I won't say it was difficult. I would rather say it takes time and lots of practice.	So you have the weak to the average, to the very strong. And we see that time and time again. So we do have to do remediation. Just as you do remediation for a particular procedure, you have to do remediation for signing if your signing is not up to scratch.

Theme 2: Sign Language for Medical Healthcare Program Effectiveness

The Professor assesses success by observing patient experiences in the clinic. Dental students often encounter DHH adults in their thirties and forties who had avoided dental care due to previous frustrating experiences. However, there has been a positive shift, with more DHH adults now receiving regular dental care. While students may not always excel in signing, DHH patients generally express gratitude for their efforts. As the sign language courses are mandatory, if students' signing proficiency is deemed unsatisfactory during clinical practice, they are required to undergo remediation and additional practice until they achieve competency in sign language. Additionally, the clinic treats many DHH children who had traumatic experiences with previous providers unable to communicate with them. As a result of the accessible environment, their pediatric patients now demonstrate compliance with dental instructions, such as flossing, indicating their understanding of the signed instructions provided by student dentists.

The UWI dental alumni also reported positive responses from their patients, both during clinical rotations and in their own practices. Alumnus 2 stated that their patients "appreciate the effort, feel more comfortable, and become more relaxed", whereas Alumnus 3 observed that while some [DHH patients] were gracious, others seemed indifferent. Alumnus 4 said their patients appreciate their effort to sign and willingly assisted when communication difficulties arose.

UWI Alumnus 1 and 2 provided similar insights into their retention of sign language knowledge beyond graduation. Both indicated that while they retained some knowledge, they experienced a decrease in proficiency and expressed a need to refresh or practice their signing skills. Alumnus 4 similarly acknowledged not being fluent but felt capable of communicating effectively with assistance from their DHH patients. UWI Alumni 1, 2, and 4 have all treated a few DHH patients in their current practices, whereas Alumnus 3 retained minimal knowledge and does not treat any DHH patients.

UWI Alumnus 1 suggested that many DHH patients prefer the university clinic over private practices, potentially limiting their exposure to treat more DHH patients. The Professor countered this notion by highlighting that students often develop strong relationships with their patients in the university clinic, and these patients may continue seeking care at the provider's new practice after they graduate. **Table 3** details participant comments regarding program effectiveness.

Table 3: Participant quotes regarding sign language retention and sustained use

	Alumnus 1	Alumnus 2	Alumnus 3	Alumnus 4	Professor
Retained information?	I retained most of my signs in the first year from school but with limited patient interactions, I would have to refresh my knowledge before confidently signing with a deaf patient.	Although I retained a significant amount of information from the courses, I also found that I lost some proficiency over time.	Almost none. If you consider that I started at zero, then perhaps I learned a lot.	Yes I have. Not 100% but as previously stated, it comes with practice and repetition.	N/A
Use sign language now?	The majority of the deaf community in my area of practice tend to patronize the public health centers. I have used sign language a few times in the practice but most often do not.	I use sign language with two patients who visit once a year.	Never	I now treat a few Deaf and Hearing Impaired patients in the office I am the only physician able to sign in the practice. Only about 5% [of patients] are deaf.	Yes, we have seen where the students take their patients with them when they leave school clinic. We're happy that [they're] that satisfied and [they] have that type of relationship. And there are practices where our graduates, um, are established as the deaf patient people.

Patient experiences with signing?	It's a lot easier to develop patient/ provider rapport if you speak or in this case sign, their language.	They appreciate the effort, feel more comfortable, and become more relaxed during their appointments.	I did find it rewarding helping our deaf patients in the university clinic some were gracious, but many seemed indifferent.	Although I am not fluent in signing, my patients appreciate the fact that I can communicate with them and they also happily assist me in areas I experience difficulties.	Sometimes we have adults who will complain Some people are patient. Some people are not. But generally, um, the deaf adults are grateful And what's most rewarding for us is the children the child is flossing that means they paid attention to all the instructions at the end we are happy to see that they recognize going to the dentist is now normal.

Theme 3: Sign Language for Medical Healthcare Program Recommendations

Each UWI participant offered several suggestions to enhance the sign language curriculum and introduce similar programs in other institutions. The Professor emphasized the importance of soliciting input from their stakeholders-DHH patients-to ensure their needs are met. They stressed the necessity for open communication between UWI and the DHH community. Additionally, the Professor advocated for including members of the DHH community as instructors, without imposing eligibility requirements based on specific degrees. They also recommended community engagement and active use of social media to encourage DHH patients to seek care at the clinic.

UWI Alumnus 2 proposed the idea of pairing students with a "signing pal" to facilitate practice and retention of sign language skills. Alumnus 3 recommended improving study resources, such as YouTube videos or an online dictionary, due to dissatisfaction with the organization of class-provided videos. They found an online American Sign Language dictionary, which intersects with some Jamaican Sign Language, to be more helpful. Alumnus 4 highlighted that pediatric patients learn signing from children's shows and recommended integrating sign language education into earlier levels of education, similar to how Spanish and French are taught in primary schools. **Table 4** provides individual feedback from UWI dental alumni and the Professor.

Table 4: Participant quotes regarding improvements to the curriculum

	Alumnus 1	Alumnus 2	Alumnus 3	Alumnus 4	Professor
Thoughts about program	I think it's a great initiative for other schools, especially health care programs to implement.	I believe that implementing sign language programs in other schools would be highly beneficial In my opinion, learning sign language is easier compared to other languages, and it greatly enhances the overall experience for deaf patients.	In hindsight I think it's a great idea.	I indeed have found the sign language course more beneficial than I had imagined The experience has been invaluable.	I think keeping a connection with the community is vital There was stakeholder input You have open dialogue. So when a deaf person is dissatisfied, you try to figure out why.
Ideas for improvement	N/A	I believe regular practice with a signing partner could have helped me maintain my skills more effectively I suggest that each student have a deaf signing pal to aid in learning.	Having a resource like a YouTube channel or a dictionary would be very helpful.	I would definitely say it should be a program incorporated like Spanish or French from as early as primary school. Children's TV programs are now incorporating ASL in their shows and I have toddlers as patients that sign to their mothers because of what they've observed on TV.	Work to get the university to hire deaf without the regular eligibility requirements. Cause the deaf teacher coming in wouldn't have a master's on at least some of that necessarily. Yeah. So that's another thing to be prepared for the administrative hurdles.

DISCUSSION

It was evident that while the majority of UWI dental alumni had positive experiences with the program, retaining and utilizing their knowledge in current dental practices, UWI Alumnus 3 had a negative experience and does not recall or use sign language after graduation. Alumnus 3, who was the earliest graduate included in our study, provided feedback suggesting that the program may have been disorganized during that time, with potential improvements made later to enhance the experiences of subsequent students. This was confirmed by feedback from Alumnus 2, who was in the following cohort, indicating some disorganization mixed with positive experiences. Additionally, Alumni 1 and 4, in later cohorts, had mostly positive experiences. Another potential explanation for UWI Alumnus 3's unique experience is that they were the only one to leave the Caribbean, which may have resulted in fewer opportunities to interact with DHH people seeking dental treatment. Additionally, UWI Alumnus 3 was the only one to pursue further education in a residency rather than joining a dental practice as the other alumni in our study did. Participating in a residency program may have limited their interactions with patients, thereby reducing opportunities to practice sign language skills. Despite mostly negative

experiences with the program, UWI Alumus 3 expressed positive sentiments in hindsight and believed that the program could benefit others.

Recommendations from the Professor and UWI alumni include the importance of stakeholder input, community engagement, and ongoing support for sign language in dental education initiatives. They mention methods such as signing partners, online resources, and early sign language education. Furthermore, their recommendations can be applied in several ways: Improving the existing program at UWI, integrating them into similar models established at other universities, or incorporating them into continued education courses for practicing dentists. Future investigations could identify perspectives of practicing dentists regarding CE courses, explore how they perceive these courses, and what potential impacts they might have on both the DHH community and the dental profession as a whole. **Table 5** outlines the overall summary of responses from UWI dental participants.

One limitation that arose in our study was the challenge of securing insurance coverage to ensure affordable treatment for DHH patients, further complicated by the difficulty in gaining the trust of DHH patients, resulting in fewer opportunities for UWI dental school alumni to maintain their proficiency in sign language through continued practice. Insurance barriers are common among underserved populations, serving as a reminder for future clinics to prioritize addressing this barrier for improved patient access. Additionally, limited ability to contact UWI dental school alumni led to a small sample size, relying solely on voluntary participation. While the qualitative data obtained is insightful, it does not represent the entire alumni body. Moreover, the information gathered relies on secondhand narratives, as the researchers lack firsthand experience with the UWI dental program.

Table 5: Summary of participant responses

	Alumnus 1	Alumnus 2	Alumnus 3	Alumnus 4	Professor
Graduation/tenure?	2022	2019	2018	2022	2000
Current position?	Practicing in Jamaica	Practicing in Caribbean	Residency in Israel	Practicing in Jamaica	Senior Lecturer
Prior experience with DHH?					
Enjoyed learning sign language?					
Retained information?					
Use sign language now?					
Ideas for improvement?	N/A	Signing buddy for practice	Online video dictionary	Start in early schooling	DHH stakeholder collaboration

CONCLUSION

In closing, the challenges faced by DHH individuals in dental offices are significant, with communication barriers often leading to socioeconomic and health disparities. The absence of inclusive communication and cultural awareness among dental providers exacerbates these challenges, highlighting the need for diversification in healthcare. Despite the passage of the Americans with Disabilities Act, many dental offices do not accommodate DHH patients.

The integration of sign language and deaf culture training into dental education curricula presents a promising solution to these challenges. A consideration is the lack of comprehensive coverage in current programs that do not adequately prepare students for real-world interactions with DHH patients. Our investigation of the unique sign language curriculum at UWI illuminates the potential benefits (and limitations) of such initiatives.

While the majority of UWI dental alumni reported positive experiences with the sign language program, hiccups including disorganization and limited opportunity for practice was noted by a participant who was among the first cohorts in the new program. Nevertheless, there is consensus among the other participants and the program developer that sign language education does enhance patient care and should be expanded. Several methods are proposed for improvement and expansion of this curriculum.

Our study brings to attention the need for improved sign language education in dental schools and healthcare

institutions. Doing so can empower future professionals to provide high-quality care to their patients, regardless of their hearing abilities. By addressing communication barriers and promoting inclusivity, a healthcare system that is accessible for all, not just DHH, is achievable.

ACKNOWLEDGMENT

We wish to thank each participant that took part in this project, and credit the University of the West Indies with the development of the unique sign language program we studied. We also give our gratitude to the Deaf Healthcare and Biomedical Science Hub for their support of this project.

CONFLICT OF INTEREST

There is no conflict of interest.

REFERENCES

1. Donald A, Rao SR, Jacobs K, MacDonald N, Kushalnagar P (2022) Unmet dental needs among mid-to-older deaf and hard of hearing women in the U.S. Front Oral Health 20(3): 866537.
2. Kruse J, Zimmermann A, Fuchs M, Rotzoll D (2021) Deaf awareness workshop for medical students-an evaluation. GMS J Med Educ 38(7): 118.
3. Rohani MM, Nor NAM (2021) Dental students' perception on disability equality training as part of the special care dentistry curriculum. J Dent Educ 85(5): 690-698.
4. U.S. Department of Justice Civil Rights Division. Guide to Disability Rights Laws.
5. Cumberbatch K, Jones T (2017) Use of Jamaican sign language in the provision of dental health care. Community Dent Health 34(2): 72-76.
6. Phelan G, Ayers E (2023) Deaf dentists diversifying healthcare: Stories of struggle and success through a comparative case report. J Healthc Commun 8(5): 8047.
7. Jones T, Cumberbatch K (2018) Sign language in dental education-a new nexus. Eur J Dent 22(3): 143-150.
8. Korleski MJ, Stefanac SJ, Inglehart MR (2023) Dentists' considerations concerning treating patients from the Deaf and Hard of Hearing community: A national survey. J Dent Educ 88: 278-288.
9. Kung MS, Lozano A, Covas VJ, Gonzalez LR, Blanco YYH, et al. (2021) Assessing medical students' knowledge of the deaf culture and community in Puerto Rico: A descriptive study. J Med Educ Curric Dev 4(8): 2382120521992326.
10. Lapinski J, Colonna C, Sexton P, Richard M (2015) American sign language and deaf culture competency of osteopathic medical students. Am Ann Deaf 160(1): 36-47.
11. Araujo DCSA, Santos JS, Barros IMC, Cavaco AMN, Mesquita AR, et al. (2019) Sign language in Brazilian pharmacy education. Am J Pharm Educ 83(8): 7239.
12. Thew D, Smith SR, Chang C, Starr M (2012) The deaf strong hospital program: A model of diversity and inclusion training for first-year medical students. Acad Med 87(11): 1496-1500.
13. Weintraub JA (2017) What should oral health professionals know in 2040: Executive summary. J Dent Educ 81(8): 1024-1032.
14. Who's in charge here? Perceptions of empowerment and role in the interpreting setting.