

Attitude, Practice and Preparedness of Dental Practitioners for Providing Oral Care to Patients with Speech and Hearing Impairment

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Abstract

Objective: To explore the attitudes, practices and preparedness of dental practitioners for providing oral care to patients with speech and hearing impairment. **Methodology:** This cross-sectional study was conducted on a sample of 467 dental practitioners between November 2021 and April 2022. A survey questionnaire was administered to practicing dental practitioners in Pakistan through online Google forms and in person. The survey included questions regarding dentists' demographic information, their attitudes and concerns, practices and views regarding training needs concerning the provision of oral care to patients with speech and hearing impairment. Data was analyzed with STATA version 16. Descriptive statistics with frequencies were computed and χ^2 was used to find out the associations between different variables.

Results: The findings suggest that a significant proportion of participants, specifically 88.22%, were unfamiliar with sign language and relied on the assistance of an attendant (54.82%) for communication purposes. According to their accounts, surgical extraction (54.4%) was perceived as the most challenging treatment to execute, whereas scaling and polishing (73.9%) was considered the easiest treatment to administer in this particular population. When it came to providing care for individuals with speech and hearing impairment, several barriers were identified. These included communication obstacles (65.3%), patient cooperation (63.2%), concerns about medical emergencies (29.1%), inadequately trained staff (26.3%), and limited experience (25.5%). The participants unanimously agreed that there is a pressing need for enhanced undergraduate training (43.68%). Additionally, they suggested that it should be obligatory for students to treat a specific number of patients with speech and hearing impairment as part of their undergraduate training (49.25%).

Conclusion: There is a need to address the identified barriers and create a better understanding between dentists and individuals with speech and hearing impairments. Basic dental signs should be learned and mastered to engage patients more effectively via non-verbal communication.

Keywords: Dentists' Opinion, Oral Care, Speech and Hearing Impairment, Sign Language Education, Language barrier

Introduction

Oral health has emerged as a significant concern for individuals with physical, sensory, mental, intellectual, medical, emotional or social disabilities owing to its predominant influence on overall well-being. The World Health Organization (WHO) estimates that globally there is a 15% disability ratio out of which 2-4% face functional limitations.¹ In Pakistan, the disability ratio stands at 3.4%, and the functional limitation rate is reported at 10.7%.² Among developmental

disabilities worldwide, deafness ranks third in terms of years lived with disability and affects over 1.5 billion people while low and middle-income countries account for around 80%. It is most prevalent in the Western Pacific Region followed by Southeast Asia.³ Such a substantial population demands specialized healthcare needs; however, those who have intellectual developmental disabilities report having more unmet requirements for general health care services like oral care and prescription medication than the general population.⁴

Individuals with developmental impairments are highly vulnerable to oral diseases due to their complex medical condition along with an inability to maintain adequate oral hygiene practices coupled with medication side effects and poor dietary habits.⁵ This situation becomes further complicated by inadequate knowledge about when dental care should be sought combined with limited access to oral healthcare facilities. Other challenges include high costs associated with treatment along with poor quality healthcare delivery given time constraints plus insufficient knowledge or skills among practitioners providing oral health care services.⁶

Poor oral health outcomes occur when multiple barriers are encountered during treatment. A comparative study carried out in Karachi revealed that disabled children had a higher proportion of poor oral hygiene compared to normal children indicating that speech/hearing impaired children were particularly susceptible to such issues.⁵ Another study found that dental caries was highly prevalent among speech/hearing-impaired children where half of them never visited a dentist.⁷ These patients also faced communication difficulties leading towards less cooperation between dentists and patients alike.⁸

Reports suggest physicians' attitudes towards differently-abled individuals plus physical accessibility problems accompanied by communication barriers pose major challenges hindering healthcare access.⁹ Addressing these issues through proper approaches is mandatory for maintaining healthy societies since they lead towards extra social/economic burdens

within any country.

To our knowledge so far this research represents the first attempt made towards addressing challenges faced by non-cognitively impaired speech/hearing-impaired individuals seeking dental treatments alongside assessing dental practitioners' practices/preparedness regarding managing such cases in Pakistan. Our research aims at assisting decision-makers in devising policies aimed at overcoming various obstacles encountered while providing oral care services specifically designed for speech/hearing-impaired individuals without significant cognitive or behavioral disorders.

Methodology

This cross-sectional study was approved by the Institutional Review Board of Dow University of Health Sciences (Ref: IRB-2450/DUHS/Approval/2022/797). The sample size of 467 subjects was calculated using PASS version 15 software, based on a test for one sample proportion with a 95% confidence interval, 80% power of the test, 5% margin of error, dentistry treated individually among developmental disabilities was (80.3%). A survey questionnaire was administered to practicing licensed dental practitioners across Pakistan through online Google forms and in person regardless of age or gender. The questionnaire was adapted and modified using previously published articles.⁶⁻¹⁰ The reliability of the questionnaire was calculated using Cronbach alpha and the value attained was 0.74. The survey includes questions regarding dentist's demographic information, opinion about willingness, practices and concerns and preparedness regarding the provision of oral care to patients with speech and hearing impairment. The answers use a 5-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree). This study includes all licensed dental practitioners who gave consent. Undergraduate students were not included in the study. Data was analyzed using STATA version 16. Descriptive statistics with frequencies were computed and χ^2 was used to find out the associations between different variables. p-value of <0.05 was taken as significant.

Results

A total of 467 licensed dental practitioners participated in the survey. The gender distribution in the surveyed population is skewed towards females (60.81%), with majority of participants falling within the 22-28 age bracket (63.60%). Geographically, most of the participants come from Sindh (60.39%), and their professional roles encompass various categories, with Interns/ House Officers comprising the largest group (32.55%). In terms of education, 70.66% of the participants hold graduate qualifications, while most of them have less than 5 years of work experience in the field (65.74%). This thorough and in-depth analysis presents an intricate and nuanced comprehension of the make-up and characteristics of the individuals involved in the study. It goes beyond a mere surface-level examination by delving into various aspects such as their gender, age, place of origin, occupational roles, levels of education, and past professional experiences within the specific group that was surveyed. Through this comprehensive exploration, valuable insights and understanding

can be gained, shedding light on the diverse and multifaceted nature of the participants' backgrounds and qualifications. The practice and its frequency has been shown in Table 1.

Table.1: Practices and attitudes of dental practitioners

Practices and concerns	Frequency (%)
Do you know sign language for dumb and deaf individuals? <ul style="list-style-type: none"> • Yes • No 	55 (11.78) 412 (88.22)
Have you ever provided dental treatment to a patient with speech/ hearing impairment? <ul style="list-style-type: none"> • Yes • No 	191 (40.90) 276 (59.10)
How do you communicate with patients with speech and hearing impairment? <ul style="list-style-type: none"> • Through sign language • With the help of his/her attendant • I have not encountered such patients yet • Other 	51 (10.92) 256 (54.82) 156 (33.40) 4 (0.84)
Do you refer patients with speech/ hearing impairment to other dental professionals? <ul style="list-style-type: none"> • Yes • No 	164 (35.12) 303 (64.88)
If YES, then to whom do you refer such patients (n=164) <ul style="list-style-type: none"> • General Dental Practitioner • Specialist/ consultant (depending on patients complain) 	x30 (18.29) 134 (81.71)
Where do you usually refer these patients (n=164) <ul style="list-style-type: none"> • Private dental hospital • Public dental hospital • Private clinic 	54 (32.93) 67 (40.85) 43 (26.22)
In your opinion, where should patients with speech/ hearing impairment be treated. <ul style="list-style-type: none"> • In the same clinic as for the general population • In special clinics • In hospitals 	146 (31.26) 244 (52.25) 77 (16.49)

The data illustrates the inclination and ease levels of dental experts in offering diagnoses and treatments for patients with speech/hearing impairment, as well as their receptiveness to receiving supplementary education in this domain. A noteworthy proportion of respondents demonstrate a favorable stance towards providing dental diagnoses (78.3% combined agree and strongly agree), and a comparable tendency is observed for the willingness to administer dental treatment (80.95% combined agree and strongly agree). Intriguingly, while the comfort levels fluctuate (51.67% combined agree and strongly agree), the confidence levels remain relatively elevated, with 75.1% expressing agreement or strong agreement in feeling self-assured while treating patients with speech/hearing impairment. Overall, the findings indicate a positive disposition among dental professionals towards addressing the requirements of patients with speech/hearing impairment, in conjunction with an eagerness to augment their competencies through further

training.

Table 2: Preparedness of dental practitioner

Preparedness	Frequency (%)
Undergraduate dental education provided me with the knowledge to treat patients with speech/hearing impairment	
Strongly disagree	121 (25.91)
Disagree	222 (47.54)
Neutral	66 (14.13)
Agree	46 (9.85)
Strongly agree	12 (2.57)
Undergraduate dental training made me confident in treating patients with speech/hearing impairment	
Strongly disagree	125 (26.77)
Disagree	195 (41.76)
Neutral	82 (17.56)
Agree	57 (12.21)
Strongly agree	8 (1.71)
More training is needed at the undergraduate level for the management of patients with speech/hearing impairment	
Strongly disagree	13 (2.78)
Disagree	11 (2.36)
Neutral	36 (7.71)
Agree	204 (43.68)
Strongly agree	203 (43.47)
Postgraduate dental education provided me with the knowledge to treat patients with speech/hearing impairment (n=265)	
Strongly disagree	24 (9.06)
Disagree	101 (38.11)
Neutral	57 (21.51)
Agree	57 (21.51)
Strongly agree	26 (9.81)
Postgraduate dental training made me confident in treating patients with speech/hearing impairment (n=265)	
Strongly disagree	19 (7.17)
Disagree	100 (37.74)
Neutral	74 (27.92)
Agree	57 (21.51)
Strongly agree	15 (5.66)
More training is needed at the postgraduate level for the management of patients with speech/hearing impairment (n=265)	
Strongly disagree	12 (4.53)
Disagree	18 (6.79)
Neutral	122 (46.04)
Agree	101 (38.11)
Strongly agree	
I think my staff is prepared to assist me in providing any emergency treatment to patients with speech/hearing impairment	
Strongly disagree	55 (11.78)
Disagree	149 (31.91)
Neutral	105 (22.48)
Agree	131 (28.05)
Strongly agree	27 (5.78)
It should be mandatory for undergraduate students to treat a certain number of patients with speech/hearing impairment	
Strongly disagree	9 (1.93)
Disagree	16 (3.43)
Neutral	60 (12.85)
Agree	230 (49.25)
Strongly agree	152 (32.55)

It should be mandatory for postgraduate students to treat a certain number of patients with speech/hearing impairment (n=265)	
Strongly disagree	9 (3.4)
Disagree	21 (7.92)
Neutral	34 (12.83)
Agree	98 (36.98)
Strongly agree	103 (38.87)

A statistically significant (p=0.01) proportion of female participants (262) and male participants (150) did not know sign language. Further analysis revealed that postgraduate dental training had a statistically significant association with gender, with regards to making them confident in treating patients with speech and hearing impairment (p=0.03). A statistically significant relationship was found between work experience and knowledge of sign language also (p=0.00) (Table 3).

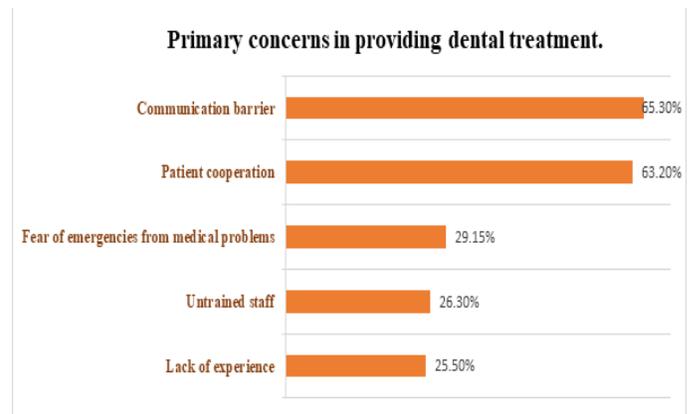


Figure 1: Primary concerns in providing oral care to patients with speech and hearing impairment.

With regard to training, a significant majority (85.01% combined agree and strongly agree) manifests a preparedness to acquire additional proficiencies for treating patients with speech/hearing impairment. Various barriers have been reported in literature regarding the provision of oral care for individuals with developmental disabilities. For instance, behavior management of patients, inadequate training and experience among dental practitioners, severity of patient's condition, inadequately trained staff as well as inadequate reimbursement were identified as common barriers by Michigan based dentists⁶, whereas Indian-based dentists cited prolonged time consumption, lack of adequate infrastructure or trained assistants along with fear related to medical emergencies from communication problems or disturbance. More than 50% of the dentists who participated in the survey (52.25%) held the belief that individuals with speech and hearing difficulties should receive treatment in specialized clinics. Nonetheless, there is currently a scarcity of such clinics, resulting in the necessity for meticulous attention in order to ensure satisfactory quality care. Similarly, it was observed in a study that a majority, accounting for more than half (57%), of individuals with speech and hearing impairments were unable to completely grasp the preventive guidelines and counseling provided by their dentist concerning measures to prevent future oral health issues due to the caregiver's restricted proficiency.

Table 3: Practices, attitudes and preparedness of dental practitioners stratified by work experience

Practices, attitude and preparedness	<5 years	5-10 years	11-15 years	16-20 years	More than 20 years	p-value
Do you know sign language for deaf and dumb individuals? <ul style="list-style-type: none"> • Yes • No 	29 278	11 95	10 24	3 12	2 3	0.00
I feel comfortable while treating patients with speech/hearing impairment <ul style="list-style-type: none"> • Strongly agree • Agree • Neutral • Disagree • Strongly disagree 	31 85 135 31 48	21 25 37 3 20	3 14 6 1 10	3 7 3 0 2	1 4 0 0 0	0.01
I feel confident while treating patients with speech/hearing impairment <ul style="list-style-type: none"> • Strongly agree • Agree • Neutral • Disagree • Strongly disagree 	27 67 145 55 13	18 25 32 25 6	2 14 7 10 1	1 6 5 3 0	2 3 0 0 0	0.00
Postgraduate dental training made me confident in treating patients with speech/hearing impairment (n=265) <ul style="list-style-type: none"> • Strongly agree • Agree • Neutral • Disagree • Strongly disagree 	5 31 50 43 8	7 18 20 24 5	3 3 1 24 3	0 3 3 7 2	0 2 0 2 1	0.00
I think that my staff is prepared to assist me in providing any emergency treatment to patients with speech/hearing impairment <ul style="list-style-type: none"> • Strongly agree • Agree • Neutral • Disagree • Strongly disagree 	15 86 78 15 25	6 32 21 6 19	5 5 3 5 8	1 4 3 1 3	0 4 0 0 0	0.00

Discussion

Individuals with developmental disabilities encounter obstacles when attempting to access oral healthcare. Research has identified the challenges associated with obtaining dental services, particularly for those with speech and hearing impairments, which present significant communication barriers. Dentists must

be fully equipped to provide oral care for these patients. Our study offers insight into how dental practitioners approach managing and treating patients with speech and hearing impairments. It has been revealed that the dental experience of patients with hearing impairment is often unpleasant.¹⁰ Our findings indicate that 33.40% of participants know individuals who have speech or hearing impairments; however, only 11.78% of them are proficient in sign language a finding consistent with Al-Shehri AA *et al.*, study in Southern Saudi Arabia where only 11.0% of dentists were familiar with sign language and lip reading.¹⁰

Communication between dentist and patient is critical during all stages of treatment; therefore, learning sign language can establish better understanding between both parties while also strengthening their bond. Dentists must become well-versed in non-verbal communication methods such as signs and gestures related specifically to dentistry for optimal patient care outcomes regarding individuals suffering from speech or hearing impediments alike.

A comparative analysis conducted by Jain S *et al.*, in India demonstrated that dentists proficient in sign language delivered an impressive 83% information retention rate among individuals affected by deafness compared to less experienced peers delivering only 36%.⁸ Similarly, a study showed that more than half (57%) of participants with speech and hearing impairment could not fully comprehend preventive guidelines nor counseling provided by their dentist regarding preventative measures against future oral health problems due to limited proficiency on behalf of the caregiver.¹¹

While unfamiliarity concerning sign language presents one barrier towards effective communication within this demographic group; literature highlights another crucial factor: healthcare professionals discussing treatment plans solely through caregivers⁹ as they act as primary means between dentist-patient interactions during appointments confirmed by over half (54%) of our surveyed respondents relying heavily on attendants for successful communication efforts.

Our study revealed that 35.12% of dental practitioners referred their patients to other dentists, a result consistent with earlier studies.^{12,13} A study found that only 29% of Jordanian dentists referred their patients for speech and language assessment by speech and language pathologists to recognize disorders. Moreover, it highlighted the fact that many dentists (58%) believed it was necessary to refer patients who want to learn sign language to a speech and language pathologist rather than a speech interpreter.¹³ More than half of the dentists surveyed (52.25%) thought that patients with speech and hearing impairment should be treated in special clinics however, few such clinics are operating at present which require high-level attention for adequate quality care.

Various barriers have been reported in literature regarding the provision of oral care for individuals with developmental disabilities. For instance, behavior management of patients, inadequate training and experience among dental practitioners, severity of patient's condition, inadequately trained staff as

well as inadequate reimbursement were identified as common barriers by Michigan-based dentists⁶, whereas Indian-based dentists cited prolonged time consumption, lack of adequate infrastructure or trained assistants along with fear related to medical emergencies from communication problems or disturbance.¹² Similarly Australian-based dentist reported difficulty managing behavioral issues along with insufficient surgical facilities.¹⁴ In Saudi Arabia majority of surveyed dentist considered treating such individuals challenging or very challenging.¹⁵ In contrast our survey showed much positive attitude towards treatment among dental practitioners towards those suffering from hearing/speech impairments- around 80.94% participants expressed willingness to provide them dental treatment.

The undergraduate education system has failed miserably in educating graduates on how best they can manage/treat people affected by developmental disorders according to previous studies.^{16,17} 73.45% of graduates disagreed or strongly disagreed with the statement that undergraduate dental education provided them with the knowledge to treat patients with speech and hearing impairment. Postgraduate trainees also disagreed with the statement that postgraduate dental education (38.11%) and training (37.74%) made them confident in treating patients with speech and hearing impairment. Our findings are similar to a study by Simi Abraham et al in the USA that highlighted the fact that pediatric residency programs still lack adequate training in special care dentistry.¹⁸ Another study by Shah *et al.*, in Saudi Arabia proposed that there needs to be a specific course designed for special care dentistry where emphasis on practical experience should be placed.¹⁵

Regarding the preparation of staff to aid dentists during any medical emergency treatment, dentists in Michigan had positive responses but our findings were unsatisfactory. It was reported that patients with hearing impairment had difficulty in communication with staff too as the contact of such patients is not just limited to dentists.^{10,19} So, dental assistants need to learn basic sign language and emergency procedures as they play roles side by side with dentists in providing primary care. Lastly we recommend including specified number of cases dealing specifically with this group into both undergraduate/postgraduate curriculae thereby boosting exposure levels alongside competence/confidence building measures .

Conclusion

There is lack of confidence and incompetent attitude due to a gap in interaction of undergraduate students with patients having compromised speech and hearing during the undergraduate level which leads to problems treating them later in practical life.

Limitations

Our research is the first of its kind signifying the communication barrier, however, there are a few limitations. The sample size of our survey was small and both Google form and self-administered questionnaire were used as means to collect the data which can be the source of bias. Nationwide studies with large sample sizes should be conducted in the future for better representative out-

comes.

Recommendations

- 1) Dental practitioners and dental assistants should learn sign language to cope with communication barriers while addressing patients with speech and hearing impairments.
- 2) The dental curriculum should be updated with guidelines to treat patients with special needs like speech and hearing impairment.
- 3) It should be made compulsory for undergraduates and postgraduate students to treat patients with speech and hearing impairment as a part of their training.

More training for the management and treatment of such patients needs to be incorporated into undergraduate as well as postgraduate curricula.

Basic sign language workshops and seminars should be arranged in the form of continuing dental education for dental practitioners throughout the country as the majority of dentists showed to be willing to get additional training in this regard.

Authors' Contribution: The authors confirm contribution to the paper as follows: study conception and design: MH data collection: ST and KR; analysis and interpretation of results: MH and KR draft manuscript preparation: ST and KR. All authors reviewed the results and approved the final version of the manuscript.

Conflict of interest: The authors have no conflict of interest.

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