Evaluation of Different Visual Method Used, to Enhance Communication Skills between Dental Care Providers and Speech and Hearing Impaired Patients

Abstract
Purpose: The purpose of this study is to evaluate the efficacy and retentiveness of various communication methods among speech and hearing impaired patients and dental practitioners. Materials and Methods: A group of 33 school participants were selected for this study. An experimental task required the participants to follow routine dental instructions in the form of videotape and photographic charts and answer the questionnaire based on visual instructions. School participants were visited twice at an interval of 1 month. Participants were randomly divided into three groups, each consisting of 11 school participants, irrespective of gender and age. Group 1 received visual instructions without showing video and charts, Group 2 received video instructions, and Group 3 received photographic instructions. The questionnaires were assessed immediately and after 1 month. Results: The study results were assessed in terms of improvement in knowledge concerning communication skills and long-term retention of the instructions for 1 month. ANOVA followed by post hoc Tukey test revealed a significant difference between Group 1 and other groups. However, there was no statistically significant difference between Group 2 and Group 3. The paired t-test revealed that there was a significant difference between the two visits in Group 1. However, there was no significant difference between visit 1 and visit 2 in Group 2 and Group 3. Conclusion: Health-care workers and patients with special needs like hearing-impaired patients should overcome communication barriers that may hinder proper diagnosis and treatment planning.

Keywords: Chart, communication, hearing impaired, speech, video

Introduction
Hearing-impaired individuals always experience significant problems with health-care providers because the health-care system does not meet their special needs for communication. An appropriate communication medium along with good communication skills will encourage them to socialize more and improve their self-esteem. There are various methods available for communication with special needs patients to bring them toward normalcy. Approaching health-care providers is often difficult for them due to the anxiety and fear of miscommunication, and as a result, they seek medical help less frequently. Most of them depend on the reading of lip movements of health-care providers. In literature, other approaches have also been discussed, which include Sign Language, Finger Spelling, Signed English, Signed Supported English, and Cued Speech. Various sign languages are used for communication with hearing impaired and speech impaired patients. These sign languages vary from one country to the other. Hearing-impaired individuals face various community problems with present communication methods and have significant problems in seeking health services. Our country, being a multicultural society, having a universal sign language to communicate may create several complexities. The purpose of this present study is to develop better communication among dentists and speech and hearing impaired patients, during dental treatment, with the help of visual instructions in the form of videos and counseling charts.

Materials and Methods
The study was approved by the Institutional ethical committee. The study was carried out in collaboration with a school...
for hearing impaired children, located at Mangalore, Karnataka, India. The questionnaire was formulated in a way that all the terms and definitions used should be comprehensible to the study participants. The terms which were challenging and difficult to understand by the participants or the field experts were either removed or simplified for better understanding. The final questionnaire was validated by dental experts and experts in speech and hearing, before distribution to the participants. A total of 20 questions were designed related to the visual aids in the form of videos, which included several signs of communication, essential during a dental procedure, with subtitles and photographic charts, used in the study. Videos and communication charts were made by dental interns [Figure 1].

The questionnaire was divided into four sections. The first section described the questions related to personal information of the patient, the second part of the questionnaire included questions on the methods of communication commonly used and problems encountered during dental treatment, either by the patient or by the dental practitioners. The third section of the questionnaire mainly focused on the visual aids used for the present study. The last part of the questionnaire was based on the satisfaction level of the participants related to the visual aids used.

The consent form, proposed questionnaire, and the information sheets for the participants were given and explained to the Institutional ethical committee before circulating to the participants.

**Methodology**

Thirty-three speech and hearing impaired participants were selected from a school and were randomly divided into three groups as follows: irrespective of the age, gender, and education of the participants. All the 33 participants possessed good communication skills and were willing to participate in the study. All the participants were healthy and did not have any associated syndrome or psychological disorder in the past. Signed informed consent forms were obtained from all the 33 participants before the commencement of the study. Three dental interns were asked to understand all the drawn instructions before their involvement in the study. After understanding the questionnaire and instructions, they were asked to explain the same to the school teachers. The study was explained in brief to the study participants by their own school teachers and dental interns. These trained interns were calibrated by the field expert for all the instructions to communicate with the study participants. The inter-rater agreement of the instructions, among the interns was measured by using the kappa coefficient during the pilot trial. After receiving a satisfactory kappa coefficient, they were asked to participate in the study.

Selected participants were divided into three groups based on the method of communication.
- Group 1– consisted of 11 participants who received instructions from dental interns without showing any visual aids
- Group 2– consisted of 11 participants who received instructions in the form of videos
- Group 3– consisted of 11 participants who received visual aids.

![Instructions to the hearing impaired patient](image)
• Group 3—consisted of 11 participants who received instructions in the form of charts containing the same photographs which had been shown in the videos.

Following the instructions, the study participants were evaluated by the interns with a validated questionnaire, immediately at visit 1, and at 1 month interval during the visit 2. The interns were blinded about the group distribution of the participants to eliminate bias. School teachers from the same school helped the interns for completing the questionnaire. Completed questionnaires were returned by the school participants to the dental interns. The same questionnaire was used at all times to determine the method which resulted in the highest retention of instructions by the participants.

Results

Using SPSS version 20.0, data were expressed in terms of mean ± standard deviation and analyzed by one-way analysis of variance, followed by post hoc Tukey test for comparing the three groups and paired t-test for comparison between the two visits. Out of 33 participants, 17 (52%) were girls and 16 (48%) were boys. Analysis of variance followed by post hoc Tukey test revealed a significant difference between Group 1 and the other groups (P < .001). However, there was no statistically significant difference between Group 2 and Group 3 immediately at day 1 and after 30 days [Tables 1 and 2]. A paired t-test showed that there was no statistically significant difference between the two visits in Group 2 as well as in Group 3. However, there was a significant difference between the two visits in Group 1 (P = 0.012) [Table 3 and Graph 1]. During the study, it was observed that in all the groups, most of the participants were not able to communicate in relation to pain and sensitivity instructions.

Discussion

Approximately 1 child in 1000 is deaf or severely hard of hearing from birth, and the number rises to about 1.6/1000 in adolescents. The causes are hereditary in 30%–39%, acquired in 19%–30% and the cause remains unknown in 31%–48% of the population.[5,6] Speech and hearing impaired patients need special attention in the dental office, as there is a large communication gap between these patients and health-care professionals. This community, like many other minority groups, has different modes of communication, which include sign language, finger spelling, cued speech, and much more. The hearing impaired community have been considered minority within the majority “hearing” culture.[6] To prevent misunderstandings between the health-care providers and these patients, it is essential to deliver an easy, unblemished, and affordable tool for enhanced communication. However, guidelines for communication with deaf dental patients are still missing.

| Table 1: Comparative evaluation of communication scores at visit 1 |
|-----------------------------------------------|
| Type of training | n | Visit 1 (mean±SD) | P |
| No media (Group 1) | 11 | 1.45±1.21 | <0.001 |
| Video (Group 2) | 11 | 14.00±2.24 | b>a |
| Charts (Group 3) | 11 | 14.09±1.97 | c>a |
| One-way ANOVA followed by post hoc Tukey test. a=No media, b=Video, c=Charts. ANOVA=Analysis of variance, SD=Standard deviation |

| Table 2: Comparative evaluation of communication scores at visit 2 |
|-----------------------------------------------|
| Type of training | n | Visit 2, mean±SD | P |
| No media (Group 1) | 11 | 0.73±0.786 | <0.001 |
| Video (Group 2) | 11 | 13.55±2.21 | b>a |
| Charts (Group 3) | 11 | 13.72±2.33 | c>a |
| One-way ANOVA followed by post hoc Tukey test. a=No media, b=Video, c=Charts. ANOVA=Analysis of variance, SD=Standard deviation |

| Table 3: Comparative evaluation of communication scores of visit 1 and visit 2 (paired t-test) |
|-----------------------------------------------|
| Type of training | n | Mean±SD | Mean difference (SD) | P |
| Visit 1 | Visit 2 | |
| No media (Group 1) | 11 | 1.45±1.21 | 0.73±0.786 | 0.727 (0.786) | 0.012 |
| Video (Group 2) | 11 | 14.00±2.24 | 13.55±2.21 | 0.454 (0.820) | 0.96 |
| Charts (Group 3) | 11 | 14.09±1.97 | 13.72±2.33 | 0.364 (1.362) | 0.397 |
| SD=Standard deviation |

Graph 1: Mean scores of the three groups for the “communication media” for speech and hearing participants (n = 33) at 1 day (dark bars) and at 1 month (light bars) interval

In literature, very few studies have been published regarding communication problems between hearing and speech impaired patients and dental practitioners. In 1993, Zazove P et al.[7] conducted a study on health status and health-care utilization of deaf and hard-of-hearing persons and concluded that deaf and hard-of-hearing persons constitute a minority population that experiences considerable difficulties in the patient-physician relationship.
According to Hines\textsuperscript{[8]} the major factor of communication was the inadequate training of both nurses and doctors in deaf awareness and the associated communication skills. They suggested that appropriate training at all staff levels should eliminate a high proportion of these problems. No statistical difference was reported in a comparative analysis of written, verbal, and videotape oral hygiene instructions for hearing impaired patients with fixed appliances by Lees \textit{et al.}\textsuperscript{[9]} Mouth mask removal during the treatments may improve communication with hearing-impaired patients.\textsuperscript{[10]} Lezzoni \textit{et al.}\textsuperscript{[11]} conducted a study on the problems faced by the deaf and hard of hearing patients and experience of physicians and concluded that effective communication is essential for safe, timely, efficient, and patient-centered care.

Deaf people are more medically and psychologically compromised as compared to hearing people and also have a low social life with majority hearing community.\textsuperscript{[12]} Successful communication between deaf patients and dentists is essential for effective care. According to Newton and Shah in 2013,\textsuperscript{[13]} by being prepared and by preparing the patient, health workers can ensure good communication, thereby giving patients access to appropriate and effective health care.

Various tools are designed to instruct deaf and mute patients, namely, flash cards, charts, sign languages, and different types of videos and recently, application of computer for the deaf and mute. Parents are not accustomed to sign language, and this method of communication is often an insufficient tool to interact with hearing-impaired patients.\textsuperscript{[6]} Sign language is a difficult task for different types of populations because it varies from one place to the other.\textsuperscript{[14]} It is also very difficult to standardize one particular sign language for the whole population. Studies have shown that the best modalities for these patients are visual signs.\textsuperscript{[15]} The present study was a comparison of different visual aids for better communication between the health-care providers and speech and hearing-impaired patients. It is recognized that no single instructional method suits all learners.\textsuperscript{[16]} In the present study, baseline knowledge (Group 1) provided maximum 15% and 10% correct responses at visit 1 and 2, respectively, indicating considerable scope for improvement. Communication scores of maximum 80% were recorded for Groups 2 and 3, for both the visits [Table 2], showing considerable improvement. Statistics of the present study showed that the retentiveness of the visual instructions were maintained up to 1 month; however, the retentiveness of the instructions given without any visual medium was not maintained for a long duration. The last section of the questionnaire revealed that patients were satisfied with the communication media and 98% of the participants suggested that these types of visual instructions should be used during communication between health-care providers and deaf and mute patients. Within the limitation of the study, long-term follow-up is required to improve the baseline knowledge of the participants. A large population of special needs patients are required to implement these visual instructions. Communicating problems were encountered during the study. However, these can be overcome by training of the participants by the trained dental experts or field experts.

In the present study, the retentiveness of instructions was evaluated for 1 month, which can be assessed for a longer period, to implement these methods in clinical practice.

**Conclusion**

To ensure a proper communication and treatment, it is essential that dental practitioners or health-care workers know the basic communication skills for deaf and mute patients. Health-care providers should be prudent enough to choose the suitable communication method to give necessary information to patients while treating. Health-care workers should implement communication methods for the better health of patients with special needs. In clinical practice, these visual instructions can be used while treating patients. This will make them feel more comfortable and confident while communicating with health-care workers.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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