



Efficacy and Feasibility of Usage of Hand Signals during Dental Procedures among General Population Attending Dental Institute in Chennai- An Observational Study

Ayushma Chakraborty, Vignesh Ravindran

Ayushma Chakraborty, BDS, Postgraduate student, Department of Pediatric and Preventive Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-77

Vignesh Ravindran, MDS, Associate Professor, Department of Pediatric and Preventive Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-77

(Received: 16 July 2025

Revised: 20 August 2025

Accepted: 29 September 2025)

KEYWORDS

Anxiety
Dental practitioner
Gesture
Hand signal
Verbal communication

ABSTRACT:

Introduction: Communication in dentistry is as crucial as treatment itself, influencing patient trust, satisfaction, and anxiety levels. Dental procedures often limit verbal communication, making it hard for patients to express pain or discomfort, which can disrupt continuity and increase stress. Dental anxiety affects up to 50% of patients, with 10–20% avoiding treatment due to fear. Non-verbal methods like hand signals (e.g., DENTISIGN) have shown promise in reducing anxiety and improving efficiency. Assessing awareness and feasibility of such methods, especially in diverse populations like Chennai, can enhance patient–dentist communication and overall treatment outcomes.

Objectives: To assess the efficacy of usage of hand signals during a dental procedure, among out-patients attending a dental institute in North Chennai.

Methods: 268 subjects were recruited for the study who required 2 or more restorative therapy, ultrasonic scaling, which required 2 appointments. Subjects were observed for the use of hand signals to communicate during treatment without any prior instruction. All the treatment procedures were done by a single operator. Before and after treatment, pre-tested questionnaires with close-ended questions about anxiety, fear, and the relative advantage of hand signals were provided. McNemar's test was used to analyze the responses for the questionnaires before and after treatment during the first and second visits.

Results: By the end of the first visit, 67.4% of subjects felt a reduction in fear with the spontaneous usage of hand signals, 73.6% felt hand signals helped them communicate with instruments in their mouths, 52% felt it could create good rapport, and 8.41% felt it helped in reducing treatment time. By the second visit, 47.54% and 60.71% felt hand signals helped them overcome fear about the dental procedure and improved communication, respectively. 90.4% felt it could help create good rapport, and 67.6% felt that hand signals helped them reduce treatment time.

Conclusions: Hand signals, even without formal instruction, can significantly help in bridging the gap of communication during dental procedures, reducing anxiety and treatment time, and building a better rapport between the patient and the dentist.

1. Introduction

The role of communication in a dental setting is as important as the technicality of the treatment. It influences patients's satisfaction and outcome of the

treatment.[1] Effective communication is vital between the practitioner and the patient to establish mutual trust and to reduce anxiety. Usage of sharp instruments that can potentially harm the patient if not used by a skilled



practitioner leads to elevated levels of stress as far as the psychology of the patient is concerned, thus an effective form of communication helps the patient gain trust on the skills of the practitioner.[2] Caring for patients not only means treating their chief complaint and relieving them from pain but also helping them overcome anxiety and fears.[3]

In dentistry when the focus of treatment is solely subjected to the oral cavity verbal communication is completely hindered during the treatment. Most patients find it difficult to communicate the simplest of commands such as expressing the sensation of sensitivity and pain.[4] Conventional ways of communication in a dental setting are primarily verbal. However, verbal communication is limited when a patient is undergoing a procedure that demands they hold their mouth open or when they are in a vulnerable state because they are being sedated or under local anesthesia.[5]

The dental practitioners lose continuity when performing procedures due to lack of proper communication which increases fatigue and time span taken to complete the planned dental procedure. This lack of proper communication makes it difficult for both the patient and the practitioner. Failure to achieve a proper communication with the patients leads to development of helplessness and anxiety in patients.[6]

Dental anxiety is a widely acknowledged condition affecting a considerable segment of the overall population. It has been made clear that up to 50% of people experience mild to moderate anxiety during dental procedures and that 10–20% of people avoid going to the dentist out of fear.[7] Though the causes of dental anxiety can vary, they frequently originate from negative experiences in the past, fear of pain, a loss of control, and a fear of injections.[8]

To counter this setback, other forms of communication based on cues and sign language can be considered as a method to bridge inefficiency during communication.[9] The awareness of sign language among the general population is low due to which expecting patients to be well taught in sign language is not practical for the patients as well as dental practitioners.[10] A study conducted by Vignesh et al in 2020, mentions the use of hand signals in a dental setting where the undergraduates participate as patients to simulate a dental setting to evaluate if there is a notable progress in terms of

reduction in levels of anxiety and time taken to complete the dental procedure with ease. It was observed that the study mentions a significant reduction in anxiety levels in undergraduates while undergoing treatment. This study employed a standardized method of hand signals terms as DENTISIGN as an intervention to bring out convincing data.[11]

Knowledge and information on hand signals such as DENTISIGN among the general population especially in suburban areas of Chennai is expected the least due to the lack of awareness regarding DENTISIGN. One of the most practically achievable protocols would be to present the patients with a set of questionnaires regarding their awareness on hand signal usage as an effective form of communication during dental procedures. The level of anxiety can also be assessed via questionnaire to evaluate the patient's overall psychology prior to dental treatment.[12] .

2. Objectives

There is a great diversity of socioeconomic backgrounds in Chennai, which is one of the main benefits of choosing this urban area.[13] In addition to people from lower-income families who might have limited access to healthcare or occasional interactions with dental professionals, the population also includes members of higher-income groups who might have better access to healthcare services and more frequent dental visits.[14] This difference in dental care accessibility and experience provides a strong basis for understanding how various socioeconomic groups interpret and apply hand signals during dental procedures. It also aids in overcoming language barriers making it much more comprehensive among diverse populations. This observational study aims to assess and analyze the efficacy and feasibility of using hand signals as a method for non-verbal communication during dental procedures, and to evaluate their impact on reducing anxiety, improving patient-dentist relationship, and enhancing overall patient satisfaction in a diverse population.

3. Methods

Study design:

This cross-sectional observational study was conducted among out-patients at a dental institute in Chennai. The participants were chosen based on their consent to take part in this study and ranged in age from 18 to 60. To



improve the methodology, a pilot study involving ten patients was first carried out. Using SPSS Software Version 17© and G-power analysis, a sample size of 250 subjects was determined based on the results of the pilot study. The study's power was set at 90% with a 5% alpha error. 268 of the 270 participants who were enrolled in the study were finalized, compensating for dropouts.

Inclusion and Exclusion Criteria:

Subjects requiring two or more dental appointments for restorative therapy or ultrasonic scaling were included in the study. Exclusion criteria were participants with chronic pain, abscesses, medically compromised conditions, or those unwilling to participate.

Protocol:

All participants were informed about the nature and purpose of the study, and informed consent was obtained. No formal training on hand signals was provided to the subjects. Instead, the study observed spontaneous usage of hand signals or other forms of non-verbal

communication during the dental procedures. A single operator performed all dental procedures to maintain consistency. The treatments were conducted in two visits: during the first visit, restorative therapy on a specific quadrant or ultrasonic scaling of one arch was performed. The same procedures were repeated for the other quadrant or arch in the second visit.

Data Collection:

Two self-administered, pre-tested questionnaires were used to collect data. The questionnaires were written in the vernacular language and contained five close-ended questions about fear, anxiety, and perceptions of non-verbal communication during the procedure. One questionnaire was administered before (seen in Table 1 and Table 2) and the other after (seen in Table 3 and Table 4) treatment at each visit. This allowed for a comparison of the subjects' anxiety levels, fear of inability to communicate, and effectiveness of hand signals.

Table 1: Patients' response to questionnaire before treatment of 1st visit:

NO.	QUESTION	YES		NO	
		N	%	N	%
1	Do you have fear or anxiety when you are undergoing any dental procedure?	175	65.3	93	34.7
2	Do you feel fear that you cannot talk to the dentist when it pains or discomforts, even with any instrument in the mouth?	167	62.3	101	37.7
3	Do you think that using hand-signs by patients would be comfortable?	86	32.1	182	67.9
4	Do you feel that using hand-signs by patients can create a good rapport with the dentist?	45	16.8	223	83.2
5	Do you think that using hand-signs by patient can reduce your treatment time on dental chair?	42	15.7	226	84.3

**Table 2:** Patients' response to questionnaire after treatment of 1st visit:

NO.	QUESTION	YES		NO	
		N	%	N	%
1	Do you think that using hand-signs helped you in communicating with the dentist even with any instrument inside your mouth?	142	53	126	53
2	Do you feel that hand-signs are easily understood by the dentist during the dental procedure?	136	50.7	132	49.3
3	Do you think that usage of hand-signs was able to reduce your fear or anxiety during the dental procedure?	134	50	134	50
4	Do you think that using hand-signs was helpful to reduce your total treatment time?	28	10.4	240	89.6
5	Do you think that usage of hand-signs should be made as a universal protocol?	31	11.6	237	88.4

Table 3: Patients' response to questionnaire before treatment of 2nd visit:

NO.	QUESTION	YES		NO	
		N	%	N	%
1	Do you have fear or anxiety when you are undergoing any dental procedure?	61	22.8	207	77.2
2	Do you feel fear that you cannot talk to the dentist when it pains or discomforts, even with any instrument in the mouth?	56	20.9	212	79.1
3	Do you think that using hand-signs by patients would be comfortable?	170	63.4	98	36.6
4	Do you feel that using hand-signs by patients can create a good rapport with the dentist?	177	66	91	34
5	Do you think that using hand-signs by patient can reduce your treatment time on dental chair?	89	33.2	179	66.8

**Table 4:** Patients' response to questionnaire after treatment of 2nd visit:

NO.	QUESTION	YES		NO	
		N	%	N	%
1	Do you think that using hand-signs helped you in communicating with the dentist even with any instrument inside your mouth?	210	78.4	58	21.6
2	Do you feel that hand-signs are easily understood by the dentist during the dental procedure?	203	75.7	65	24.3
3	Do you think that usage of hand-signs was able to reduce your fear or anxiety during the dental procedure?	193	72	75	28
4	Do you think that using hand-signs was helpful to reduce your total treatment time?	189	70.5	79	29.5
5	Do you think that usage of hand-signs should be made as a universal protocol?	186	69.4	82	30.6

Statistical Analysis:

The responses from the pre- and post-treatment questionnaires were analyzed using McNemar's test to assess any statistically significant changes in fear, anxiety, and perceived benefits of hand signals. A p-value of <0.05 was considered statistically significant.

4. Results

A total of 268 subjects participated in the study, with a nearly equal distribution of males (49.8%) and females (50.2%). Age-wise, 31.6% (n=85) of the participants were under 30 years old, 54.6% (n=146) were between 30 and 50 years, and 13.8% (n=37) were above 50 years. Regarding educational background, 48% (n=129) had completed only schooling, while 52% (n=139) were graduates. Socioeconomic classification based on income revealed that 71% (n=190) of the subjects earned less than Rs. 10,000 per annum, whereas 29% (n=78) had an annual income exceeding Rs. 10,000.

Prior to treatment during the first visit, 65.3% (n=175) of subjects experienced fear or anxiety regarding dental procedures. Additionally, 62.3% (n=167) expressed concern about their ability to communicate pain or

discomfort with dental instruments in their mouths. A smaller proportion, 32.1% (n=86), reported feeling comfortable using spontaneous hand signals to convey their needs. Only 16.8% (n=45) believed that non-verbal communication could enhance their rapport with the dentist, and 15.7% (n=42) felt it might contribute to a reduction in treatment time.

Following treatment during the first visit, 53% (n=142) of subjects reported that hand signals helped them communicate effectively with their dentist. Moreover, 50.7% (n=136) perceived that the dentist could accurately interpret their non-verbal cues. A reduction in fear or anxiety was noted by 50% (n=134) of the participants, whereas 10.4% (n=28) experienced a reduction in overall treatment time. However, only 11.6% (n=31) supported the idea of incorporating non-verbal communication into a standardized universal protocol to enhance dentist-patient interactions.

During the second visit, a notable decrease in pre-treatment anxiety was observed, with only 22.8% (n=61) of subjects expressing fear or anxiety about undergoing dental procedures. Similarly, only 20.9% (n=56) anticipated difficulty in communicating pain or



discomfort due to dental instruments in their mouths. In contrast, 63.4% (n=170) believed that spontaneous hand signals could improve their comfort level during treatment, and 66% (n=177) acknowledged the potential of non-verbal communication in fostering better rapport with their dentist. Furthermore, 33.2% (n=89) of participants perceived that non-verbal communication could contribute to a reduction in treatment time.

After treatment during the second visit, 78.4% (n=210) of subjects affirmed that hand signals significantly improved communication. Additionally, 75.7% (n=203) believed that their non-verbal cues were effectively understood by the dentist. Anxiety reduction was reported by 72% (n=193) of participants, while 70.5% (n=189) experienced a perceived decrease in treatment duration. Notably, 69.4% (n=168) of the subjects endorsed the integration of non-verbal communication into a standardized protocol for dental practice.

A comparison of responses before treatment between the first and second visits demonstrated a significant reduction in anxiety and communication barriers. Among the 175 subjects who initially reported fear or anxiety, 72% (n=126) no longer experienced pre-treatment fear by the second visit. Similarly, 76.04% (n=127) of the 167 participants who initially feared difficulty in communicating discomfort found that their apprehensions had diminished. Moreover, 70.3% (n=128) of the 182 subjects expressed increased comfort with the use of hand signals, while 68.01% (n=152) of the 223 subjects acknowledged that hand signals contributed to better rapport with the dentist. However, 69.02% (n=156) of the 226 participants did not perceive a significant reduction in treatment time by the start of the second visit. All these findings were statistically significant (p=0.001).

A post-treatment comparison between the first and second visits further underscored the efficacy of hand signals in facilitating communication and reducing

anxiety. By the end of the second visit, 57.4% (n=72) of the 126 subjects affirmed that hand signals improved communication with the dentist. Furthermore, 54.54% (n=72) of the 132 subjects felt that their non-verbal cues were more easily understood. A reduction in anxiety was reported by 48.5% (n=65) of the 134 subjects who had initially experienced fear. Additionally, 69.16% (n=166) of the 240 subjects observed a decrease in treatment duration, and 67.08% (n=159) of the 237 subjects recommended that hand signals be adopted as a universal communication protocol. All results were statistically significant (p=0.001).

An overall comparison of responses before and after treatment during both visits highlighted a progressive reduction in fear and communication barriers with the use of hand signals. By the end of the first visit, 67.4% (n=118) of the 175 subjects reported decreased fear, and 73.6% (n=123) of the 167 participants found that hand signals aided communication despite the presence of dental instruments, both showing statistical significance (p<0.001). Additionally, 52% (n=116) of the 223 participants acknowledged that hand signals facilitated a better rapport with their dentist. However, only 8.41% (n=19) of the 226 subjects initially skeptical about treatment time reduction perceived an actual decrease, yielding a statistically significant value (p=0.023).

By the second visit, 47.54% (n=29) of the 61 subjects who had persistent fear of dental procedures and 60.71% (n=34) of the 56 subjects who anticipated difficulty in communication found that hand signals helped them, both demonstrating significant statistical values (p<0.001). Among the 177 subjects who initially believed non-verbal communication could enhance rapport, 90.4% (n=160) confirmed its effectiveness after treatment, with a statistically significant result (p<0.001). Lastly, of the 179 subjects who initially expected no change in treatment duration, 67.6% (n=121) later reported that hand signals contributed to reducing the overall treatment time. (seen in Table 8)

Table 5: Comparison of Patients' response to questions before treatment between 1st and 2nd visit:

Do you have fear or anxiety when you are undergoing any dental procedure?	1st	2nd		P-Value
		Yes	No	



		N	%	N	%	
	Yes	49	80.3	126	60.9	0.001
	No	12	19.7	81	39.1	
Do you feel fear that you cannot talk to the dentist when it pains or discomforts, even with any instrument in the mouth?	1st	2nd				P-Value
		Yes		No		
		N	%	N	%	
	Yes	40	71.4	127	59.9	0.001
	No	16	28.6	85	40.1	
Do you think that using hand-signs by patients would be comfortable?	1st	2nd				P-Value
		Yes		No		
		N	%	N	%	
	Yes	47	27.6	39	39.8	0.001
	No	123	72.4	59	60.2	
Do you feel that using hand-signs by patients can create a good rapport with the dentist?	1st	2nd				P-Value
		Yes		No		
		N	%	N	%	
	Yes	25	14.1	20	22.0	0.001
	No	152	85.9	71	78.0	
	1st	2nd				P-Value



		Yes		No		
		N	%	N	%	
Do you think that using hand-signs by patient can reduce your treatment time on dental chair?	Yes	19	21.3	23	12.8	0.001
	No	70	78.7	156	87.2	

Table 6: Comparison of Patients' response to questions after treatment between 1st and 2nd visit:

	1st	2nd				P-Value
		Yes		No		
		N	%	N	%	
Do you think that using hand-signs helped you in communicating with the dentist even with any instrument inside your mouth?	Yes	138	65.7	4	6.9	0.001
	No	72	34.3	54	93.1	
Do you feel that hand-signs are easily understood by the dentist during the dental procedure?	Yes	131	64.5	5	7.7	0.001
	No	72	35.5	60	92.3	
Do you think that usage of hand-signs was able to reduce your fear or anxiety during the dental procedure?	Yes	128	66.3	6	8.0	0.001
	No	63	33.7	74	38.0	



	No	65	33.7	69	92.0	
Do you think that using hand-signs was helpful to reduce your total treatment time?	1st	2nd				P-Value
		Yes		No		
		N	%	N	%	
	Yes	23	12.2	5	6.3	0.001
	No	166	87.8	74	93.7	
Do you think that usage of hand-signs should be made as a universal protocol?	1st	2nd				P-Value
		Yes		No		
		N	%	N	%	
	Yes	27	14.5	4	4.9	0.001
	No	159	85.5	78	95.1	

Table 7: Comparison of Patients' response before and after treatment of 1st visit:

Do you have fear or anxiety when you are undergoing any dental procedure?	Do you think that usage of hand-signs was able to reduce your fear or anxiety during the dental procedure?				P-Value
	Yes		No		
	N	%	N	%	
Yes	118	87.4	57	42.5	<0.001
No	17	12.6	77	57.5	
Do you feel fear that you cannot talk to the dentist when it pains or discomforts, even with any instrument in the mouth?	Do you think that using hand-signs helped you in communicating with the dentist even with any instrument inside your mouth?				P-Value



	Yes		No		
	N	%	N	%	
Yes	123	86	45	35.7	<0.001
No	20	14	81	64.3	
Do you feel that using hand-signs by patients can create a good rapport with the dentist?	Do you feel that hand-signs are easily understood by the dentist during the dental procedure?				P-Value
	Yes		No		
	N	%	N	%	
Yes	20	14.7	25	18.8	0.369
No	116	85.3	108	81.2	
Do you think that using hand-signs by patient can reduce your treatment time on dental chair?	Do you think that using hand-signs was helpful to reduce your total treatment time?				P-Value
	Yes		No		
	N	%	N	%	
Yes	9	32.1	33	13.7	0.023
No	19	67.9	208	86.3	

Table 8: Comparison of Patients’ response before and after treatment of 2nd visit:

Do you have fear or anxiety when you are undergoing any dental procedure?	Do you think that usage of hand-signs was able to reduce your fear or anxiety during the dental procedure?				P-Value
	Yes		No		
	N	%	N	%	



Yes	29	15	32	42.7	<0.001
No	164	85	43	57.3	
Do you feel fear that you cannot talk to the dentist when it pains or discomforts, even with any instrument in the mouth?	Do you think that using hand-signs helped you in communicating with the dentist even with any instrument inside your mouth?				P-Value
	Yes		No		
	N	%	N	%	
Yes	34	16.2	22	37.9	<0.001
No	176	83.8	36	62.1	
Do you feel that using hand-signs by patients can create a good rapport with the dentist?	Do you feel that hand-signs are easily understood by the dentist during the dental procedure?				P-Value
	Yes		No		
	N	%	N	%	
Yes	160	78.8	17	26.2	<0.001
No	43	21.2	48	73.8	
Do you think that using hand-signs by patient can reduce your treatment time on dental chair?	Do you think that using hand-signs was helpful to reduce your total treatment time?				P-Value
	Yes		No		
	N	%	N	%	
Yes	68	36.0	21	26.6	0.136
No	121	64.0	58	73.4	



5. Discussion

Effective communication is the cornerstone of successful dental care, yet traditional verbal exchanges are often hindered during treatment due to the presence of instruments in the patient's mouth. This limitation can lead to increased patient anxiety, misunderstandings, and a lack of control over the treatment process. Hand signals offer a simple yet powerful solution by enabling patients to convey discomfort, request a break, or express concerns without interrupting the procedure. They serve as an intuitive, universally accessible, and non-verbal communication method that requires no linguistic proficiency, making them particularly beneficial for children, individuals with disabilities, and those with language barriers. By fostering better dentist-patient interaction, hand signals can enhance trust, reduce fear, and improve overall treatment experiences. Their integration into dental practice not only ensures smoother procedures but also empowers patients by actively involving them in their own care, ultimately leading to improved satisfaction and compliance with dental treatments.

The use of hand signals during dental procedures is increasingly recognized as a valuable tool for enhancing communication between patients and dentists, especially in situations where verbal interaction is restricted due to ongoing treatment. Several studies, including those by Sanjana Santhosh K et al. and Khalifah et al., [15,16] have highlighted the role of hand signals in alleviating patient anxiety, streamlining treatment processes, and improving the overall dental experience for both practitioners and patients. Their significance in dentistry cannot be overstated, as conventional verbal communication is often compromised when dental instruments obstruct speech. This communication barrier can heighten anxiety and leave patients feeling vulnerable. By incorporating hand signals, patients can effectively convey discomfort, request a pause, or express concerns in a simple and intuitive manner, facilitating seamless interaction without the need for speech.

Our study demonstrates that the use of hand signals significantly reduces patient anxiety, with 67.4% of patients reporting decreased fear by the end of their first visit. This finding aligns with research by Badran et al., [17] which explored the relationship between oral health

literacy and dental anxiety. Their study indicated that greater oral health literacy correlates with improved patient outcomes, while individuals with lower literacy levels often struggle with communication, exacerbating their anxiety. Hand signals serve as an effective solution to this challenge by offering a straightforward, nonverbal means of communication that requires no specialized training. This approach empowers all patients, regardless of literacy level, by fostering a sense of control and active participation in their dental care.

The study by Khalifah and Celenza [16] focuses on the critical role of dentist-patient communication skills, which are typically emphasized in dental education. However, in a clinical setting, effective verbal communication can be hindered by dental instruments and patient positioning, making it insufficient on its own. Their findings suggest that hand signals offer a practical and efficient means to overcome these limitations without requiring extensive training, providing an immediate and intuitive communication method.

Dental anxiety remains one of the primary reasons patients avoid seeking care, significantly impacting their access to timely treatment. [17] In our study, patients who independently utilized hand signals—without prior instruction—experienced a marked reduction in anxiety across both visits, with 47.54% reporting diminished fear by their second appointment.

Tulsani et al., [18] explored the use of anti-anxiety medications to alleviate postoperative discomfort and anxiety following dental implant procedures. While pharmacological interventions can be effective in managing anxiety, they carry the risk of side effects and may complicate the treatment process. In contrast, hand signals provide a non-invasive and immediate communication strategy, allowing patients to maintain a sense of control and autonomy during dental procedures. This empowerment is particularly beneficial, as it enables real-time, individualized interaction between the patient and the dentist, fostering a more comfortable treatment experience.

Additionally, studies by Sanjana Santhosh K et al. [15] and the present investigation highlight the advantages of hand signals in reducing the cognitive and physical strain on dentists. Dental procedures can be demanding, especially when treating anxious patients who frequently interrupt treatment to verbally express discomfort. By



streamlining communication, hand signals minimize disruptions, improve efficiency, and help maintain a structured workflow. In our study, 67.6% of patients reported that hand signals contributed to shorter treatment durations, likely due to fewer interruptions and more efficient resolution of patient concerns.

While patient preferences play a role in shaping communication dynamics, Prenetha and Prabakar [19] examined how perceptions of male and female dentists influence patient satisfaction. Although their study focused on gender-based differences, it underscored the broader importance of effective communication in fostering positive treatment experiences. In the present study, the use of hand signals further enhanced communication by mitigating potential barriers related to personal biases or expectations, ultimately contributing to improved dentist-patient rapport and streamlined treatment sessions.

In contrast, our study observed the spontaneous use of hand signals, reflecting a more realistic dental experience. While this method allowed us to examine patients' intuitive, real-time use of nonverbal cues, it introduced potential inconsistencies in how the signals were applied or understood. Nevertheless, these findings suggest that hand signals can be seamlessly integrated into dental procedures without the need for formalized training.

References

1. Ho CY, Chai H, Lo EC, Huang Z, Chu CH. Dentist-patient communication in quality dental care. *Front Oral Health* 2024.
2. Yavagal, P.; Raj, R.; Kateel, P.; Mrunal, S.; Diwakar, N.; Lokapur, R. Attitude towards Learning Communication Skill among Dental Interns in Davanagere City: A Cross-Sectional Survey. *J. Indian Assoc. Public Health Dent.* 2023, 21 (1), 54. https://doi.org/10.4103/jiaphd.jiaphd_26_2
3. Salim NA, Sallam M, Aldweik RH, Sawair FA, Sharairh AM, Alabed A. Rating communication skills in dental practice: the impact of different sociodemographic factors. *BMC Medical Education.* 2023;23(1):950. doi: 10.1186/s12909-023-04958-y
4. Gragoll I, Schumann L, Neubauer M, Westphal C, Lang H. Healthcare avoidance: a qualitative study of dental care avoidance in Germany in terms of emergent behaviours and characteristics. *BMC Oral Health.* 2021;21(1):563. doi: 10.1186/s12903-021-01933-1
5. El Dalatony MM, Alshareef RI, Alkahtani AR, et al. Patient satisfaction as a determinant of patient loyalty to the dentist in dental clinics. *J Patient Exp.* 2023;10:23743735231166506. doi: 10.1177/23743735231166506.
6. Hall JA, Horgan TG, Murphy NA. Nonverbal Communication. *Ann Rev Psych.* 2019;70:271–294. doi: 10.1146/annurev-psych-010418-103145
7. Ali SJ, Babu KY, Jayaraj G. Awareness of importance of research in undergraduate dental students. *Int J Res Pharm Sci.* 2020;11(SPL3):1677-1684.
8. Szabó RM, Buzás N, Braunitzer G, Shedlin MG, Má A. Factors influencing patient satisfaction and loyalty as perceived by dentists and their patients. *Dentistry J.* 2023;11(9):203. doi: 10.3390/dj11090203
9. Easson E. Communicating effectively with patients. *British Dental Journal Team.* 2020;7(10):21. doi: 10.1038/s41407-020-0467-x
10. Yuan S, Freeman R, Hill K, Newton T, Humphris G. Communication, Trust and Dental Anxiety: A Person-Centred Approach for Dental Attendance Behaviours. *Dent J (Basel).* 2020;8(4):118. Published 2020 Oct 13. doi:10.3390/dj8040118
11. Vignesh R, Priyadarshni I, Sukanya T. Efficacy and feasibility of usage of hand signals during dental procedure among students in a Dental Institute in Maduravoyal, Chennai: A cross-sectional study. *Indian J Dent Res.* 2020;31(5):678-684. doi:10.4103/ijdr.IJDR_38_19
12. Kalaivani V, Srisakthi, Indiran MA, Jayakumar ND. Measurement of oral health literacy (REALD30) and oral health status among construction workers in Chennai: A cross-sectional study. *J Pharm Negat Results.* 2022;13(Special Issue 9):3599. doi:10.47750/pnr.2022.13.S09.446



13. Sushanthi S, Doraikannan S, Indiran MA. Assessment of anxiety, depression, and nicotine dependence among construction workers in Chennai: A cross-sectional study. *J Oral Biol Craniofac Res.* 2022;12(2):263-267. doi:10.1016/j.jobcr.2022.03.004.
14. Roshan A, Sangeetha S, Sridevi G. Knowledge and awareness on teledentistry among dentists-an online survey. *Int J Pharm Res.* 2020;12:3214-3222.
15. Sanjana Santhosh K, Hima Bindu R, Elavenil P, Bharathwaj VV, Krishna Kumar Raja VB (2023) Is There A Need For Hand Signs In Dentistry For “Intra-Operative” Patient-Dentist Communication? – A Cross-Sectional Study. *J Comm Med and Pub Health Rep* 2023;4(12) doi: 10.38207/JCMPHR/2023/DEC041204155.
16. Khalifah AM, Celenza A. Teaching and assessment of dentist-patient communication skills: a systematic review to identify best-evidence methods. *J Den Educ.* 2019;83(1):16–31. doi: 10.21815/JDE.019.003
17. Badran A, Keraa K, Farghaly MM. The impact of oral health literacy on dental anxiety and utilization of oral health services among dental patients: a cross sectional study. *BMC Oral Health.* 2023;23(1):146. doi: 10.1186/s12903-023-02840-3
18. Tulsani M, Ganapathy D, Rupawat D, Devi S. Effectiveness of antianxiety drugs on postoperative pain perception after implant placement: An in vivo study. *J Adv Oral Res.* 2021;12:232020682098148. doi:10.1177/2320206820981485
19. Prenetha R, Prabakar J. A cross-sectional hospital-based study on how patients perceive the dental care provided by male or female dentists. *J Adv Pharm Technol Res.* 2022;13(Suppl 1):S254-S258. doi:10.4103/japtr.japtr_198_2