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Integrating mudra therapy for stress relief during extraction of teeth

Kalaipreetha.P

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I. INTRODUCTION

Dental anxiety is a common barrier to seeking timely dental care, often leading to avoidance and exacerbation of oral health issues. It encompasses fear and anxiety related to preventive visits and procedures, which can originate from negative experiences, social influences, or psychological predispositions. Globally, the prevalence of dental anxiety varies widely, ranging from 4.2% to over 50%, influenced by cultural and demographic factors.[1,2]

Traditional methods of managing dental anxiety, such as pharmacological sedation, cognitive-behavioral therapy, and distraction techniques, can be resource-intensive and may not suit all patients. There is a growing interest in non-invasive, holistic interventions that are accessible, cost-effective, and culturally sensitive. One such approach is **Mudra Therapy**, a practice rooted in traditional Indian medicine, involving hand gestures believed to harmonize the mind and body. Mudras have been shown to alleviate stress, enhance emotional balance, and promote relaxation.[3,4]

This study explores the integration of Mudra Therapy, specifically the **Gyan Mudra**, into clinical dental practice to manage anxiety during tooth extraction. By leveraging this innovative, patient-centered approach, the research aims to evaluate its effectiveness as an adjunctive technique for stress relief. The scope of **Mudra Therapy** extends beyond mere relaxation; it is thought to influence the nervous system, enhance brain function, and promote emotional balance. By activating specific pressure points on the hands, mudras are believed to stimulate endorphin production, improve mood, and increase overall vitality.[5,6,7] They also support mental clarity and focus, which can be particularly beneficial in medical settings where anxiety can impair a patient's ability to relax.

The **Gyan Mudra**, used in this study, is a simple yet powerful gesture, formed by bringing the tip of the thumb and index finger together, while keeping the other fingers extended. This gesture is known to enhance concentration, improve memory, and reduce stress, making it an ideal choice for managing dental anxiety.[8]

The effectiveness of Mudra Therapy lies in its accessibility, ease of practice, and non-invasive nature. It requires no special equipment, can be easily learned by patients, and can be performed discreetly during dental treatments. Given its holistic approach, Mudra Therapy holds significant potential in complementing traditional anxiety management techniques, providing a culturally sensitive and low-cost solution for patients who may otherwise avoid dental care due to fear or anxiety.[9,10]

II. MATERIALS AND METHODOLOGY

A pilot study was designed to evaluate a method aimed atreducing anxiety during tooth extraction. The study seeks toassess the feasibility and effectiveness of using specifictechniques, such as performing mudras, to help patients managetheir anxiety levels.This pilot study was designed with a total of 50 patients.

Sl.no	Inclusion criteria	Exclusion criteria
1.	Patients across all age ranges and sex Physiologically sound patients.	Individuals with musculoskeletal conditions Patients with cardiac issues Individuals with suspected or confirmed heart ailments Loss of Consciousness-Those experiencing fainting episodes unrelated to syncope Psychological/Cognitive Issues Patients with mental health or cognitive impairments Individuals with psychological or cognitive disabilities Compliance Concerns Patients with questionable treatment adherence

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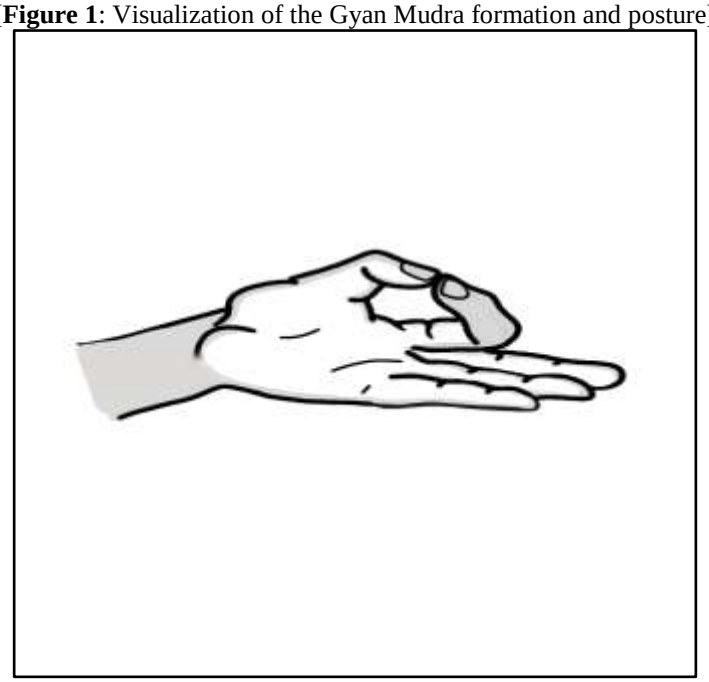
		Individuals with potential non-compliance Patients unable to give consent Individuals unwilling or incapable of providing informed consent Pregnancy

Formation: The Gyan Mudra is formed by gently touching the tip of the thumb and the index finger together, while the remaining three fingers—the middle, ring, and little fingers—are kept straight and relaxed. This simple yet powerful gesture is designed to promote focus and mental clarity.

Posture: The mudra can be performed while seated comfortably. The hands should rest naturally on the thighs or on the handle of the dental chair, allowing the patient to maintain the position without strain during the dental procedure. This relaxed posture aids in enhancing the benefits of the mudra while also keeping the patient comfortable.

[**Figure 1**: Visualization of the Gyan Mudra formation and posture]



Methodology:

Positioning the Patient: The patient is comfortably seated in the dental chair, ensuring proper posture for both comfort and ease during the procedure.

Teaching Mudras: Before the procedure begins, the patient is instructed on the specific hand gestures (mudras) to be used during the tooth extraction. This ensures that the patient understands the process and feels confident in performing the mudra correctly.

Mudra Positioning: The patient is asked to gently position the tip of their forefinger against the thumb, forming the Gyan Mudra. The pressure between the thumb and forefinger should be light and comfortable, ensuring the patient can maintain the gesture without strain during extraction of teeth.[figure 2]

Figure 2: The patient is performing the mudra while the surgeon does the extraction of teeth

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Monitoring Vital Signs: Before the administration of local anesthesia, the patient's vital signs, including blood pressure and pulse, are recorded to establish a baseline.

Preoperative Anxiety Assessment: The patient's anxiety levels are assessed using the Visual Analogue Anxiety Scale (VAAS) to measure their initial state of anxiety before the procedure begins.

Intraoperative Monitoring: After local anesthesia is administered, the patient's blood pressure, pulse rate, and anxiety levels are monitored at regular intervals to assess any changes during the procedure. The patient should continue to maintain the mudra position throughout the extraction.

Tooth Extraction: Once the patient's anxiety and vital signs are stable, and their consent is obtained, the tooth extraction is performed following standard dental procedures.

Postoperative Monitoring: After the extraction, the patient's blood pressure, pulse rate, and anxiety levels are monitored to observe any immediate changes and ensure they remain within safe limits.

III. RESULTS

Table 1: Distribution of frequency and percentage of gender in the study group

		Frequency	Percentage
Gender	Female	25	50.0
	Male	25	50.0
	Total	50	100.0

Table 2: Distribution of frequency and percentage of age

		Frequency	Percentage
Age	15-25 years	8	16.0
	26-35 years	8	16.0
	36-45 years	12	24.0
	46-55 years	8	16.0
	56-65 years	11	22.0
	>65 years	3	6.0
	Total	50	100.0

Table 3: Comparison of mean systolic blood pressure at different time intervals in the study group – One way repeated measures ANOVA

	Mean systolic blood pressure	Std. Deviation	Wilk's Lambda	F statistic	Partial eta squared	P value	Observed power
Pre operative	131.08	13.201	0.48	25.977	0.520	<0.001**	1.000
Intra Operative	134.60	11.287					
Post operative	126.40	7.494					

**p<0.001 – Highly signficant

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A one way repeated measures analysis of variance (ANOVA) was conducted to evaluate the null hypothesis that there is no change in subjects' mean systolic blood pressure when measured before, during and after extraction procedure(N=50). The results of ANOVA indicated significant time effect, Wilk's Lambda= 0.48, F = 25.977, P<0.05, η2=0.520(Large effect size). The evidence is significant to reject the null hypothesis.

Graph 3:

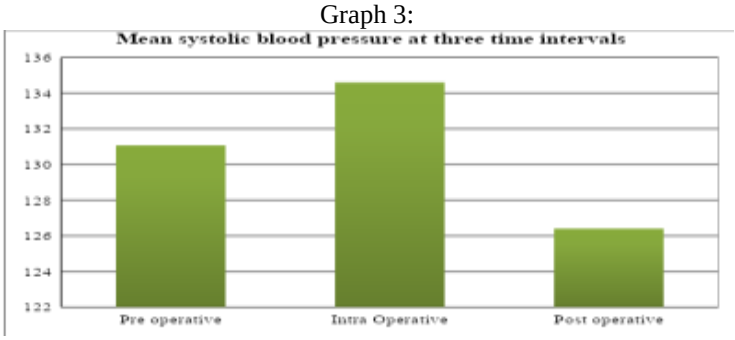

Table 4: Pairwise comparison – Bonferroni post hoc test(Systolic blood pressure)

(I) TIME	(J) TIME	Mean Difference (I-J)	Std. Error	P value	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
Pre operative	Intra operative	-3.520*	1.255	.022	-6.631	-.409
	Post operative	4.680*	1.226	.001	1.641	7.719
Intra operative	Pre operative	3.520*	1.255	.022	.409	6.631
	Post operative	8.200*	1.132	.000	5.394	11.006
Post operative	Pre operative	-4.680*	1.226	.001	-7.719	-1.641
	Intra operative	-8.200*	1.132	.000	-11.006	-5.394

*Statistically significant difference p<0.0

Table 5: Comparison of mean diastolic blood pressure at different time intervals in the study group – One way repeated measures ANOVA

	Mean diastolic blood pressure	Std. Deviation	Wilk's Lambda	F statistic	Partial eta squared	P value	Observed power
Pre operative	83.90	6.048	0.723	9.195	0.277	0.004*	0.969
Intra operative	83.10	5.429					
Post operative	80.80	3.405					

*p<0.05 – Statistically significant

A one way repeated measures analysis of variance (ANOVA) was conducted to evaluate the null hypothesis that there is no change in subjects' mean diastolic blood pressure when measured before, during and after extraction procedure(N=50). The results of ANOVA indicated significant time effect, Wilk's Lambda= 0.723, F = 9.195, P<0.05, η2=0.277(Large effect size). The evidence is significant to reject the null hypothesis.

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Table 6: Pairwise comparison (Bonferroni test) – Diastolic blood pressure

(I) TIME	(J) TIME	Mean Difference (I-J)	Std. Error	P value	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
Pre operative	Intra operative	.800	1.059	1.000	-1.824	3.424
	Post operative	3.100*	.826	.001	1.052	5.148
Intra operative	Pre operative	-.800	1.059	1.000	-3.424	1.824
	Post operative	2.300*	.823	.022	.259	4.341
Post operative	Pre operative	-3.100*	.826	.001	-5.148	-1.052
	Intra operative	-2.300*	.823	.022	-4.341	-.259

*Statistically significant difference p<0.05

Graph 4:

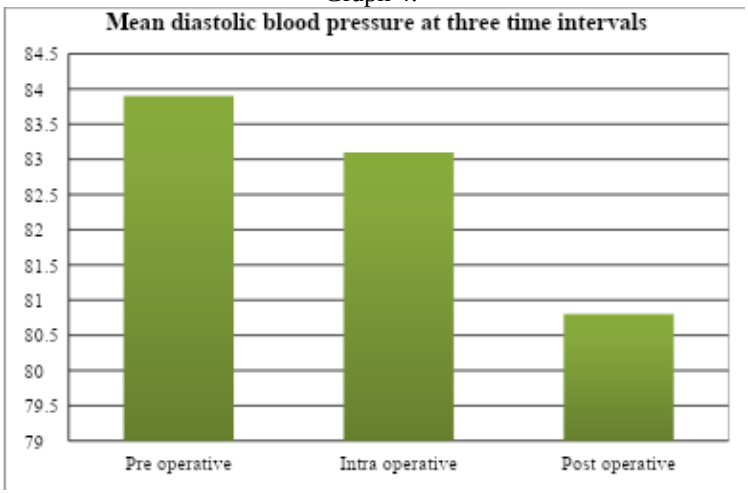

Table 7: Comparison of mean pulse rate at different time intervals in the study group – One way repeated measures ANOVA

	Mean pulse rate	Std. Deviation	Wilk's Lambda	F Statistic	Partial eta squared	P value	Observed power
Pre operative	84.26	7.23881	0.794	6.235	0.206	0.022*	0.875
Intra operative	84.92	7.32299					
Post operative	83.24	6.73571					

*p<0.05 – Statistically significant

A one way repeated measures analysis of variance (ANOVA) was conducted to evaluate the null hypothesis that there is no change in subjects' mean pulse rate when measured before, during and after extraction procedure(N=50). The results of ANOVA indicated significant time effect, Wilk's Lambda= 0.794, F = 6.235, P<0.05, η^2=0.206 (Large effect size). The evidence is significant to reject the null hypothesis.

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Table 8: Pairwise comparison – Bonferroni test(Pulse rate)

(I) TIME	(J) TIME	Mean Difference (I-J)	Std. Error	P value	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
Pre operative	Intra operative	-.660	.563	.741	-2.056	.736
	Post operative	1.020	.415	.052	-.008	2.048
Intra operative	Pre operative	.660	.563	.741	-.736	2.056
	Post operative	1.680*	.525	.007	.379	2.981
Post operative	Pre operative	-1.020	.415	.052	-2.048	.008
	Intra operative	-1.680*	.525	.007	-2.981	-.379

Statistically significant difference p<0.05

Graph 5:

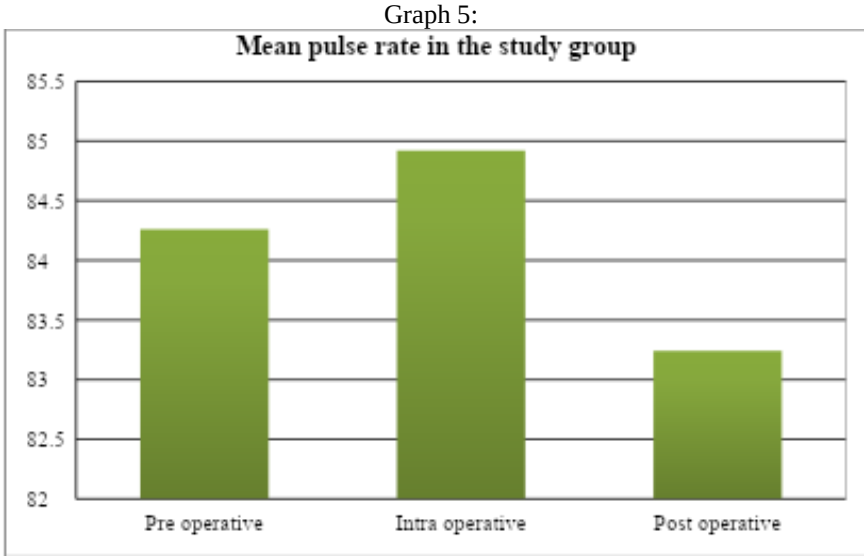

Table 9: Comparison of mean anxiety score at different time intervals in the study group – One way repeated measures ANOVA

	Mean anxiety score	Std. Deviation	Wilk's Lambda	F statistic	Partial eta squared	P value	Observed power
Pre operative	3.08	1.988	0.454	28.809	0.546	<0.001**	1.000
Intra operative	1.10	1.594					
Post operative	0.58	1.326					

**p<0.001 – Highly signficant

A one way repeated measures analysis of variance (ANOVA) was conducted to evaluate the null hypothesis that there is no change in subjects' mean anxiety score when measured before, during and after extraction procedure(N=50). The results of ANOVA indicated significant time effect, Wilk's Lambda= 0.454, F = 28.809, P<0.05, η2=0.546 (Large effect size). The evidence is significant to reject the null hypothesis.

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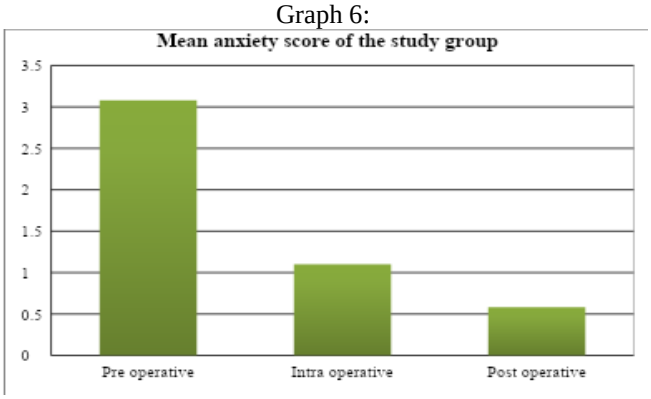
Table 10: Pairwise comparison – Bonferroni test(Anxiety score)

(I) TIME	(J) TIME	Mean Difference (I-J)	Std. Error	P value	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
Pre operative	Intra operative	1.980*	.302	.000	1.232	2.728
	Post operative	2.500*	.338	.000	1.661	3.339
Intra operative	Pre operative	-1.980*	.302	.000	-2.728	-1.232
	Post operative	.520	.256	.143	-.114	1.154
Post operative	Pre operative	-2.500*	.338	.000	-3.339	-1.661
	Intra operative	-.520	.256	.143	-1.154	.114

*Statistically significant difference p<0.05

Graph 6:



This pilot study explored the use of **Mudra Therapy**, specifically **Gyan Mudra**, to reduce anxiety during tooth extractions. Fifty patients participated, with equal gender representation and various age groups. The patients performed Gyan Mudra before and during the procedure. Anxiety levels were measured using a Visual Analog Anxiety Scale (VAAS), and vital signs like blood pressure and pulse rate were monitored. The results showed that **Mudra Therapy** significantly reduced anxiety, as evidenced by lower anxiety scores postoperatively. Additionally, systolic and diastolic blood pressure, as well as pulse rate, decreased after the procedure. Statistical analysis confirmed that these changes were significant.

IV. DISCUSSION

Anxiety Reduction

One of the most significant findings of this study was the substantial reduction in anxiety scores postoperatively. Anxiety levels decreased from a preoperative score of 3.08 to 0.58 following the procedure ($p < 0.001$), highlighting the potential of Gyan Mudra as an effective, non-pharmacological intervention for managing dental anxiety. This result aligns with earlier research demonstrating the benefits of mindfulness and relaxation techniques in reducing stress in medical settings [11][12]. By fostering mental clarity and relaxation, Mudra Therapy helps patients focus on the present moment, alleviating fears and anxieties, which is particularly valuable for dental procedures that often provoke intense emotional responses.

Physiological Improvements

The observed reductions in physiological parameters further support the effectiveness of Mudra Therapy. Both systolic and diastolic blood pressure, as well as pulse rate, showed significant improvements. Systolic blood pressure decreased from 131.08 mmHg to 126.40 mmHg, while diastolic pressure fell from 84.26 mmHg to 83.24 mmHg. These changes correspond with studies indicating that relaxation techniques activate the parasympathetic nervous system, leading to reduced cardiovascular stress [13][14]. Such improvements are particularly important for

patients who are more susceptible to hypertension or tachycardia due to anxiety, underscoring the potential utility of Mudra Therapy in maintaining cardiovascular stability during dental procedures.

Accessibility and Ease of Implementation

An additional advantage of Mudra Therapy is its accessibility and simplicity. This technique requires no specialized equipment and can be easily taught to patients before their procedures. The Gyan Mudra gesture can be performed discreetly during dental treatments, empowering patients to take control of their anxiety without interrupting the clinical process. This ease of implementation makes it an attractive option for patients seeking alternatives to pharmacological methods, particularly those preferring a holistic or culturally sensitive approach to anxiety management [15][16].

Implications for Clinical Practice

The findings suggest that Mudra Therapy could serve as a valuable adjunct to traditional anxiety management techniques in dental practices. Pharmacological methods, such as sedation and anti-anxiety medications, are commonly employed but may not be suitable for all patients due to potential side effects or contraindications. In contrast, Mudra Therapy offers a non-invasive, cost-effective, and culturally sensitive alternative. Integrating this approach into clinical practice could provide patients with an empowering tool to manage their anxiety, enhancing their overall experience and compliance with dental care [17][18].

Limitations and Future Research

While this study presents promising results, its limitations must be acknowledged. The small sample size of 50 patients and the pilot design may limit the generalizability of the findings. Future research with larger sample sizes, control groups, and long-term follow-up will be essential to confirm the effectiveness of Mudra Therapy across diverse patient populations and dental procedures [19][20]. Additionally, future studies could explore the potential of other mudras or investigate the combined effects of Mudra Therapy with complementary techniques, such as guided imagery or deep breathing exercises, to assess their synergistic impact on patient anxiety [21][22][23][24].

V. CONCLUSION:

In conclusion, this study highlights the potential of **Mudra Therapy** as an effective, non-invasive technique to reduce anxiety and improve physiological outcomes during tooth extractions. By integrating this traditional practice into modern dental care, clinicians could offer patients a simple, accessible, and culturally relevant method for managing dental anxiety. Further investigation is warranted to establish the broader applicability and long-term benefits of Mudra Therapy in clinical dental settings.

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