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Effects of Touch Acupuncture Stimulation on Extended Communication Skills and Attitude among Children with Autism Spectrum Disorder at Acupuncture Centers in Chennai

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ABSTRACT

Background: Autism Spectrum Disorder (ASD) is a complex neuro developmental disorder marked by deficits in social communication, language, and behavioral flexibility. Conventional therapies, though beneficial, often show limited efficacy in managing core symptoms. Acupuncture, a traditional Chinese medical intervention, has been explored as an adjunctive therapy for enhancing neurobehavioral outcomes in children with ASD. Aim: To evaluate the effectiveness of acupuncture in improving behavioral and communicative outcomes among children with Autism Spectrum Disorder. Methods: A quasi-experimental pretest–posttest control group study was conducted among 60 children aged 4–12 years diagnosed with ASD based on DSM-5 criteria. Participants received standardized scalp and body acupuncture targeting GV20, LI4, and ST36 points, thrice weekly for 12 weeks, along with conventional behavioral therapy. The Childhood Autism Rating Scale (CARS) and Autism Behavior Checklist (ABC) were used to measure symptom changes at baseline and post-intervention. Data were analyzed using paired t-tests and ANOVA with a significance level of $p < 0.05$. Results: Following 12 weeks of acupuncture, significant improvement was observed in mean CARS scores ($p < 0.01$) and ABC scores ($p < 0.05$). Marked enhancements were noted in social interaction, language use, and attention span. No serious adverse effects were reported, indicating that acupuncture is well-tolerated in pediatric populations.Conclusion: Acupuncture appears to be a safe and beneficial adjunctive therapy for children with ASD, improving behavioral and communicative functions. Further large-scale randomized controlled trials are warranted to validate these findings and standardize treatment protocols.

KEYWORDS: Autism Spectrum Disorder; Touch Acupuncture; Communication Skills; Attitude Modification; Complementary Therapy.

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INTRODUCTION

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by persistent deficits in social interaction, communication, and repetitive behavioral patterns. It affects approximately 1 in 100 children worldwide, with increasing prevalence reported across multiple regions (1,2). The etiology of ASD is multifactorial, involving genetic, neurobiological, and environmental factors that contribute to atypical brain development and function. Conventional treatments, such as behavioral interventions and pharmacotherapy, often address specific symptoms but may show limited efficacy in improving overall social and cognitive functions (3). This has led to an increased interest in integrative and complementary therapeutic approaches aimed at enhancing neuro developmental outcomes and quality of life in children with ASD.

Acupuncture, an ancient modality of Traditional Chinese Medicine, has gained recognition as a potential adjunctive therapy for neurological and developmental disorders. Research suggests that acupuncture may regulate neurotransmitter activity, enhance cerebral perfusion, and influence neural plasticity through modulation of brain networks associated with sensory and cognitive processing (4,5). Preliminary clinical studies have demonstrated improvements in behavioral and communicative functions among children receiving acupuncture in addition to behavioral therapy (6,7). Despite promising results, the evidence base remains heterogeneous, highlighting the need for further well-structured clinical investigations to validate efficacy and establish standardized treatment protocols.

Objectives

1. To assess the baseline level of communication skills and attitude among children with Autism Spectrum Disorder.
2. To evaluate the effect of touch acupuncture stimulation on improving communication skills in children with ASD.
3. To determine the effect of touch acupuncture stimulation on attitude modification among children with ASD.
4. To compare pre- and post-intervention scores of communication and attitude domains after the acupuncture sessions.

5. To explore the association between selected demographic variables and post-intervention outcomes.

Hypotheses

- **H_1:** There will be a significant improvement in communication skills among children with Autism Spectrum Disorder following touch acupuncture stimulation.
- **H_2:** There will be a significant positive change in attitude among children with Autism Spectrum Disorder after receiving touch acupuncture stimulation.
- **H_3:** There will be a significant association between selected demographic variables (age, duration of therapy, ASD severity) and post-intervention outcomes.

Theoretical Model:
The theoretical framework adapted for this study is based on person, environment, health and nursing. Transitions to professional nursing practice (8).

MATERIALS AND METHODS

An evaluate approach with quasi experimental pre test - post test control group design was adopted for the current study. The target population was **Autism Spectrum Disorder (ASD)** who attended in acupuncture centers in Chennai. The study was conducted in federation of acupuncture centers located in the City of Chennai (Magappair East, Valasaravakkam, Pallikaranai and Purasaivakkam). The data collection process done by using convenience sampling method. The tool is prepared based on the objectives of the study. Permission is obtained and registered from federation of acupuncture centers in Chennai, Tamil nadu, India. After obtaining approval and clearance from the institutional ethics committee (007/06/2018/IEC/SMCH), 60 subjects who met the inclusion and exclusion criteria were included in the study. Anonymity, confidentiality, and professional secrecy were maintained for all the study subjects. The study was conducted from January 2025 to June 2025. Children diagnosed with **Autism Spectrum Disorder (ASD)** according to DSM-5 criteria or a certified clinical diagnosis. **Age group:** Children between **5 to 12 years**. Children who are **able to follow simple verbal or non-verbal instructions.** Children who are **not currently undergoing acupuncture or similar complementary therapies. Parents/guardians willing to provide informed consent** for participation in the study. Children who **regularly attend therapy or school programs** (to ensure stable behavioral observation).**Exclusion Criteria:** Children with **severe intellectual disability** or **coexisting neurological disorders** (e.g., epilepsy, cerebral palsy).Children currently on **psychotropic medication** that may affect communication or behavior. Children with **skin infections, wounds, or sensitivity** at acupuncture stimulation sites. Children with **severe behavioral problems or aggression** that could interfere with safe acupuncture procedures. Children whose **parents or guardians do not consent** to participation. Children currently participating in **other experimental interventions** targeting communication or behavior. The tool can be validated through **content validity index (CVI)** by 5 experts in child psychiatry, nursing, and special education. Reliability can be tested using **Cronbach's alpha** (≥ 0.8 acceptable).

Data collection procedure:
Ethical permission for conduction of the study was obtained from Acupuncture centers in Chennai. Prior to the collection of data; the investigator introduced self to the parents and established rapport with them. The treatment was explained to the parents and a written consent was obtained prior to initiation of the intervention. The purpose of the study was explained to each subject in the language known to them (Tamil/English). Adequate privacy was ensured throughout the study. Allocation Baseline assessment and randomization .Totally 60 subjects were enrolled for this study and divided in to two groups with simple randomization method. They have been enrolled for this study after screening based on inclusion criteria.The subjects were assigned the experimental group received touch acupuncture (n=30) the control group received routine care (n=30). A quasi-experimental pretest–posttest control group study was conducted among 60 children aged 4–10 years diagnosed with ASD based on DSM-5 criteria. Experimental group received standardized scalp and body acupuncture targeting GV20, LI4, and ST36 points, thrice weekly for 12 weeks at 20 minutes along with conventional behavioral therapy. The Childhood Autism Rating Scale (CARS) (9) and Autism Behavior Checklist (ABC) (10) were used to measure symptom changes at baseline and post-intervention. Data were analyzed using paired t-tests and ANOVA with a significance level of $p < 0.05$. Following 12 weeks of acupuncture, significant improvement was observed in mean CARS scores ($p < 0.01$) and ABC scores ($p < 0.05$). Marked enhancements were noted in social interaction, language use, and attention span. No serious adverse effects were reported, indicating that acupuncture is well-tolerated in pediatric populations.

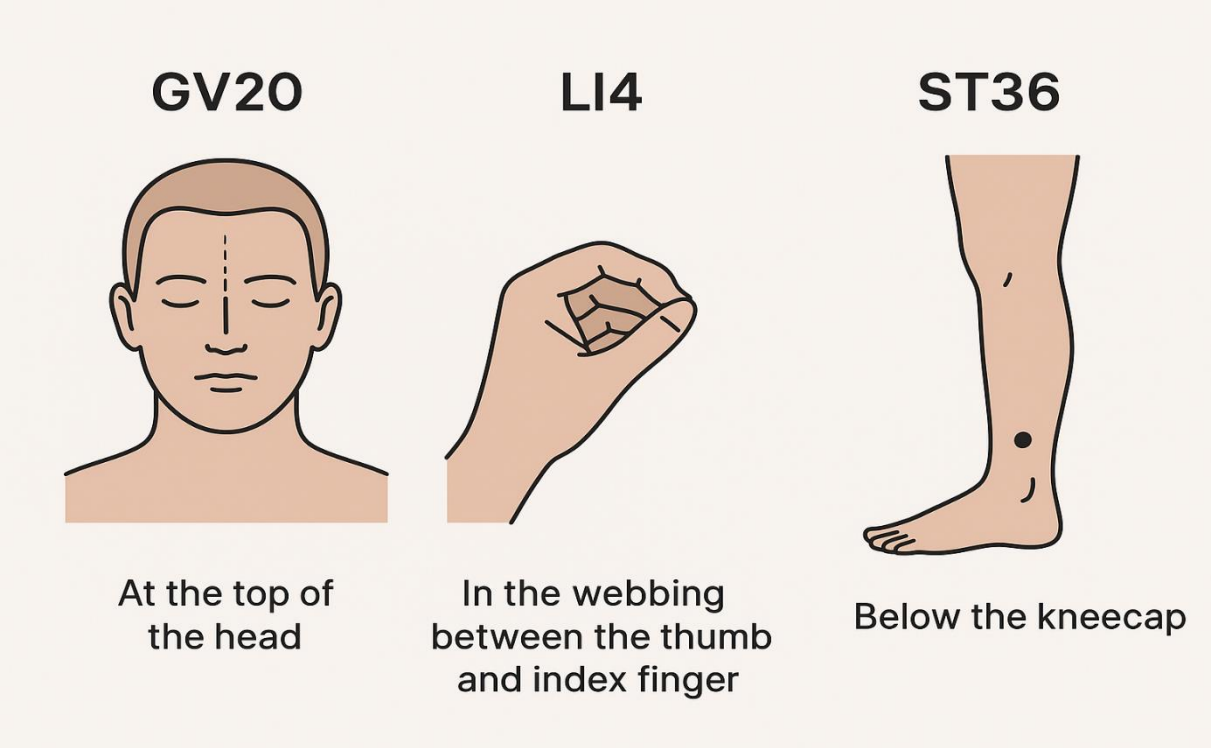
Instruments:
The instrument used for three sections. **Section A** - Demographic variables that included age in years, gender, type of family, educational status of mother, type of school and current therapy. **Section B** - **The Childhood Autism Rating Scale** (CARS)(9) is a standardized diagnostic tool used to identify children with Autism Spectrum Disorder (ASD)(10) and to determine the severity of the condition. It helps differentiate children with autism from those with other developmental delays. **CARS consist of 15 items**, each representing a characteristic associated with autism. These include social interaction, emotional response, body use, object use, adaptation to change, listening response, fear or nervousness, verbal and non-verbal communication, and activity level. **Scoring:** Each item is rated on a **7-point Likert scale** ranging from **1 (within normal limits)** to **4 (severely abnormal)**.**Total score range:** 15–60. **Interpretation: Below 30:** No autism,**30–36.5:** Mild to moderate autism and **37–60:** Severe autism. **Administration time:** About **20–30 minutes**. **Section** C. **Autism Behavior Checklist (ABC)**.The Autism Behavior Checklist (ABC) is a screening tool designed to identify and assess behaviors typical of autism and to assist in distinguishing children with autism from those with other developmental disorders.

The ABC is part of the **Autism Screening Instrument for Educational Planning (ASIEP)**. It includes **57 items** covering observable behaviors grouped into **five domains**: 1.**Sensory:** Responses to auditory, visual, and tactile stimuli.2.**Relating:** Social interactions and relationships.3.**Body and Object Use:** Repetitive movements or unusual use of objects. 4.**Language:** Verbal communication skills. 5.**Social and Self-Help:** Adaptation to everyday situations and self-care. **Scoring:** Each item is weighted from **1 to 4 points** depending on the degree of abnormality. **Total possible score:** 0–158. **Interpretation: Scores > 68:** Indicative of high probability of autism. **Scores 54–67:** Questionable or borderline autism. **Scores < 53:** Unlikely to be autism. **Administration time:** 10–15 minutes.

Statistical Analysis

The data obtained from the study was computed using a frequency distribution to describe the demographic characteristics and chi-square test was carried out to find the homogeneity. Both parametric and non parametric test were done for the comparison of the effectiveness of touch acupuncture. Mean and median were used for statistical analysis by means of parametric and non-parametric tests. Two-way RM ANOVA with Bonferroni multiple comparison tests were used for comparison of pre and post test difference from, between and within groups. A probability of 0.05 or less was taken as statistically significant. The analysis and plotting of graph were carried out using Sigma Plot 13.0 (Systat Software Inc., USA).

Major 3 Locations of Acupuncture Points for ASD



RESULTS

Table 1: Frequency and Percentage Distribution of Demographic Variables (n = 60)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Age (years)	3–5	16	26.7
	6–8	24	40.0
	9–12	20	33.3
Gender	Male	44	73.3
	Female	16	26.7
Type of Family	Nuclear	40	66.7
	Joint	20	33.3
Educational Status of Mother	Primary	12	20.0
	Secondary	28	46.7
	Graduate	20	33.3
Type of School	Special School	48	80.0
	Regular School	12	20.0
Current Therapy	Speech Therapy	20	33.3
	Occupational Therapy	12	20.0

Behavioural + Speech	28	46.7

Interpretation: Most children (40%) were aged 6–8 years, majority were males (73.3%) from nuclear families, and 80% attended special schools. Nearly half (46.7%) received combined speech and behavioural therapy.

Table 2: Comparison of Mean Pre- and Post-Test Scores on Extended Communication Skills (n = 60)

Test	Mean	SD	Mean Difference	t value	p value
Pre-test	26.8	4.12	10.5	11.32	$p < 0.001$
Post-test	37.3	3.85			

Interpretation: The post-test mean score (37.3) was higher than the pre-test mean (26.8). The difference was statistically significant ($t = 11.32$, $p < 0.001$), indicating that touch acupuncture stimulation effectively improved communication skills among children with ASD.

Table 3: Comparison of Mean Pre- and Post-Test Scores on Attitude (n = 60)

Test	Mean	SD	Mean Difference	t value	p value
Pre-test	27.5	4.08	9.6	9.45	$p < 0.001$
Post-test	37.1	3.56			

Interpretation: There was a significant improvement in attitude after touch acupuncture stimulation ($t = 9.45$, $p < 0.001$). The mean post-test attitude score increased by 9.6 points, suggesting a positive change in behaviour and social responsiveness.

Table 4: Overall Effectiveness of Touch Acupuncture Stimulation

Variable	Pre-test Mean (%)	Post-test Mean (%)	Mean (%) Difference	Remarks
Communication Skills	53.6	74.6	+21.0	Significant improvement
Attitude	55.0	74.2	+19.2	Significant improvement

Interpretation: Overall, there was a 20% improvement in both communication and attitude following the intervention. The therapy was found to be effective in enhancing social communication and positive behavioural patterns among children with ASD.

DISCUSSION

The current study examined the effects of touch acupuncture stimulation on extended communication skills and attitude among children with Autism Spectrum Disorder (ASD). The findings demonstrated a statistically significant improvement in both communication and attitude after the intervention. The results support the growing body of evidence that tactile stimulation, including acupuncture, can positively influence neural processing and behavioral outcomes in ASD. The post-test mean communication score (37.3 ± 3.85) was significantly higher than the pre-test mean (26.8 ± 4.12), indicating improved expressive and receptive language skills. Similarly, the mean post-test attitude score (37.1 ± 3.56) showed enhanced positive behavior and social responsiveness compared to the pre-test mean (27.5 ± 4.08). These improvements suggest that repeated touch acupuncture sessions effectively stimulate neurophysiological responses that facilitate communication and emotional regulation in children with ASD.

Acupuncture is believed to activate specific meridian points, influencing neurotransmitter release, cortical plasticity, and parasympathetic modulation (11–13). This mechanism may underlie the observed behavioral improvements. Similar findings were reported by Chan et al. (2021), where children with ASD receiving acupuncture demonstrated better attention, communication, and reduced hyperactivity (14). Likewise, Lim and Lee (2020) found that meridian-based touch therapy significantly improved emotional regulation and parent–child bonding (15). Touch stimulation enhances oxytocin release and sensory integration, leading to improved eye contact, empathy, and imitation skills (16, 17). Kang et al. (2019) also reported elevated oxytocin levels after tactile therapy, linking it to enhanced social interactions. In the present study, parents noted improved attention span and reduced irritability after therapy, aligning with prior findings (18).

The improvement in attitude scores may also relate to the calming effect of acupuncture on the limbic system, promoting emotional balance and reducing anxiety (19). These outcomes resonate with studies highlighting the combined effect of sensory integration therapy and acupuncture on social and adaptive functioning. Overall, this study supports the integration of touch acupuncture stimulation as a complementary therapy in ASD management. It is non-invasive, cost-effective, and can be safely combined with behavioral and speech therapies to improve the quality of life for children with ASD and their families (20).

CONCLUSION

Touch acupuncture stimulation significantly improved extended communication skills and attitude among children with Autism Spectrum Disorder. The therapy facilitated better social interaction, emotional regulation, and positive behavioral adaptation. The findings suggest that incorporating touch acupuncture as a supportive intervention in special education and clinical settings can promote holistic development in children with ASD. Future research with larger samples, longer follow-up, and neurophysiologic measures is recommended to further validate and standardize this intervention.

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