

## A Study to Assess the Effectiveness of Tuina Massage Technique on Toddlers for Reduce the Body Temperature in Selected Hospital, At Kanpur

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### ABSTRACT

**Background:** Fever is a common symptom in toddlers and often leads to discomfort and concern among parents. While pharmacological interventions are widely used, non-pharmacological approaches such as *Tuina* massage—a traditional Chinese therapeutic technique—have shown promise in regulating body temperature in children. This study examines the effectiveness of *Tuina* massage in reducing body temperature among toddlers.

**Aim:** To assess the effectiveness of the *Tuina* massage technique in reducing body temperature among toddlers in selected hospitals of Kanpur, Uttar Pradesh.

**Methods:** A quasi-experimental non-equivalent control group pre-test post-test design was adopted. A total of 80 toddlers aged 1 to 3 years were selected using a non-probability purposive sampling technique, with 40 toddlers each assigned to experimental and control groups. The experimental group received *Tuina* massage during episodes of elevated body temperature, while the control group received standard care. Body temperature was recorded before and after the intervention using a standardized digital thermometer. Data were analyzed using descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics (paired and unpaired *t*-tests, and chi-square test).

**Results:** The findings revealed a statistically significant reduction in body temperature in the experimental group following the administration of *Tuina* massage, compared to the control group ( $p < 0.05$ ). A significant association was also observed between post-intervention body temperature and selected demographic variables such as gender and age of the toddler.

**Conclusion:** *Tuina* massage is an effective, low-cost, and safe non-pharmacological intervention for reducing body temperature in toddlers. It may be considered as a supportive technique in routine pediatric care for *managing mild to moderate fever*.

**Keywords:** *Tuina massage, body temperature, toddlers, non-pharmacological intervention, fever management, quasi-experimental study.*

### INTRODUCTION

Fever is a common clinical manifestation in toddlers, typically defined as children aged one to three years, and is frequently one of the earliest indicators of an underlying illness. It serves as a natural protective mechanism triggered by infectious and non-infectious agents, regulated primarily by the hypothalamus in response to pyrogens and prostaglandins.<sup>1</sup> In this age group, fever is especially concerning due to the immature immune system, increased metabolic demand, and heightened risk of complications such as febrile seizures, dehydration, and irritability.<sup>2</sup> Parents and caregivers often experience heightened anxiety when their child exhibits fever, making effective and safe management strategies essential in pediatric healthcare.<sup>3</sup>

Traditional fever management typically includes pharmacological agents such as acetaminophen or ibuprofen. However, growing concerns over potential side effects and drug resistance have led to increased interest in non-pharmacological approaches (World Health Organization [WHO], 2022).<sup>4</sup> Among these, *Tuina* massage—an integral component of Traditional Chinese Medicine (TCM)—has gained attention for its therapeutic potential. *Tuina* involves the application of specific manipulative techniques, including pushing, kneading, pressing, and rolling over selected acupoints to restore balance in the body's energy (Qi), promote circulation, and support immune regulation.<sup>5</sup> Historically practiced in China,

*Tuina* has been increasingly recognized in modern integrative medicine for its effectiveness in pediatric conditions, including fever, digestive disturbances, and sleep disorders.<sup>6</sup>

In toddlers, whose physiological systems are still developing, *Tuina* offers a gentle and non-invasive alternative. Studies have demonstrated that massage therapies, including *Tuina*, can activate the parasympathetic nervous system, reduce cortisol levels, and modulate thermoregulation by improving peripheral circulation and enhancing lymphatic drainage.<sup>7</sup> Moreover, targeted stimulation of pediatric acupoints is believed to harmonize Yin and Yang, clear heat, and relieve surface symptoms, thereby assisting in temperature reduction. Recent trials conducted in Chinese pediatric clinics have reported significant improvements in fever-related symptoms following *Tuina* interventions, suggesting its applicability in broader clinical settings.<sup>8</sup>

Given the increasing interest in holistic and patient-centered care, especially for vulnerable populations like toddlers, evaluating the effectiveness of traditional, low-risk interventions such as *Tuina* massage is timely and relevant. This study aims to assess the impact of *Tuina* massage on reducing body temperature among toddlers in selected hospitals of Kanpur, with the broader goal of integrating evidence-based complementary therapies into routine pediatric practice.

### NEED FOR THE STUDY

Fever remains one of the most common clinical presentations in pediatric care and a major cause of hospital visits among toddlers aged one to three years. It acts as a physiological response to infection or inflammation and is regulated by the hypothalamus through endogenous pyrogens such as interleukin-1 and tumor necrosis factor-alpha.<sup>9</sup> Toddlers, due to their developing immune systems and higher metabolic rates, are particularly susceptible to temperature fluctuations. The World Health Organization (2022) highlights that childhood fever contributes to a significant burden on healthcare systems in low- and middle-income countries, where access to appropriate pharmacologic treatments may be limited.<sup>10</sup>

Non-pharmacological methods are gaining attention due to growing concerns over drug resistance, adverse effects of antipyretics, and parental preferences for natural and safe alternatives. Among these, *Tuina* massage, a component of Traditional Chinese Medicine (TCM), has shown promise in clinical studies. It involves specific manual techniques applied to acupoints to stimulate thermoregulation, circulation, and immune balance.<sup>11</sup> A quasi-experimental study conducted at Dr. Soekardjo Hospital, Indonesia, demonstrated that pediatric massage therapy significantly reduced body temperature from an average of 38.58°C to 37.45°C ( $p < 0.000$ ), confirming its antipyretic effect in febrile children.<sup>12</sup>

In India, while awareness of *Tuina* is growing, its integration into mainstream pediatric care is limited due to the lack of large-scale clinical trials and regional data. Sarah Pritchard (2021) notes that although *Tuina* is gaining popularity as a complementary therapy, its application in India remains anecdotal, with minimal documentation or evaluation of outcomes. Locally, in Kanpur, pediatricians are increasingly approached by parents seeking safer and less invasive fever management strategies. However, evidence-based guidance on such interventions remains scarce.<sup>13</sup>

A systematic review by Fu et al. (2020) reported that *Tuina*, when used alongside antipyretics, accelerated fever resolution within 120 minutes, with a standardized mean difference (SMD) of 0.90 (95% CI: 0.50–1.30).<sup>14</sup> Similarly, Gao L's (2018) meta-analysis emphasized the superiority of massage over pharmacological agents in improving appetite and systemic symptoms in toddlers. Despite these promising findings, most existing studies are concentrated in China, and there is an urgent need to validate these results within the Indian context.<sup>15</sup>

Moreover, local experimental evidence is emerging. A pre-experimental study conducted in a selected hospital in Kanpur observed improved appetite and temperature regulation among toddlers following daily *Tuina* massage over six days, indicating a potential for holistic growth promotion and fever control. These findings underscore the necessity of further controlled investigations to establish safety, efficacy, and standard protocols for *Tuina* therapy in Indian pediatric settings.

Therefore, this study seeks to bridge the existing knowledge gap by systematically evaluating the effectiveness of *Tuina* massage in reducing body temperature among toddlers in selected hospitals of Kanpur. The research has the potential to contribute significantly to pediatric nursing practice, promoting the integration of safe, affordable, and culturally acceptable non-pharmacological interventions into mainstream child health care.

## STATEMENT OF THE PROBLEM

**“A study to assess the effectiveness of tuina massage technique on toddlers for reduce the body temperature in selected hospital, at Kanpur”.**

## OBJECTIVES

1. To determine the level of body temperature of toddler in control group and experimental group.
2. To determine the effectiveness of Tuina massage in toddler in experimental group.
3. To find out the association between the post-test level of temperature and demographic variable of toddler in both experiment and control group.

## HYPOTHESIS

**H1:** A notable reduction in the body temperature of toddlers occurs following the application of the Tuina massage technique.

**H2:** A significant correlation exists between the fluctuations in temperature and the chosen demographic variables of toddlers in both the experimental and control groups.

### Null Hypotheses:

**H01:** The administration of the Tuina massage technique does not result in a notable reduction in the body temperature of toddlers.

**H02:** There is no significant correlation between temperature changes and the chosen demographic variables of toddlers in both the experimental and control groups.

## METHODS AND MATERIALS

### Research Approach

A quantitative evaluative approach was used to objectively assess the effectiveness of Tuina massage in reducing body temperature among toddlers.

### Research Design

The study adopted a quasi-experimental, non-equivalent control group pre-test post-test design. The experimental group received Tuina massage, and the control group received routine care. Body temperature was measured pre- and post-intervention using a digital thermometer.

Group	Pre-Test (O <sub>1</sub> /O <sub>3</sub> )	Intervention (X)	Post-Test (O <sub>2</sub> /O <sub>4</sub> )
Experimental	O <sub>1</sub> : Body temp recorded	X: Tuina massage	O <sub>2</sub> : Body temp recorded
Control	O <sub>3</sub> : Body temp recorded	No massage (routine care)	O <sub>4</sub> : Body temp recorded

### Research Setting

Pilot study was conducted at Rama Hospital, Kanpur. The main study was carried out at Anurag and Pravi Hospitals, Kanpur, selected based on availability of eligible toddlers and accessibility.

### Variables

- **Independent Variable:** Tuina massage technique
- **Dependent Variable:** Body temperature of toddlers

- **Demographic Variables:** Age, weight, gender, family background, education, income, prior knowledge of Tuina, etc.

### **Population**

The present study population consist of Hospitalized toddlers aged 1–3 years with elevated body temperature in Kanpur.

### **Target population**

In this study, the target population was toddlers aged 1 to 3 years with body temperature admitted in hospitals at Kanpur.

### **Accessible population**

In this study, the accessible population was toddlers aged 1 to 3 years with body temperature admitted in Anurag hospital and Pravi hospital at Kanpur.

### **Sample & Sample Size**

Total sample: 80 toddlers (40 experimental, 40 control). Sample size was calculated using Cochran's formula.

### **Sampling Technique**

Non-probability purposive sampling was used to select toddlers meeting the inclusion and exclusion criteria.

### **Sampling Criteria**

#### **Inclusion Criteria**

##### **Toddler's**

- With a body temperature of 36.4°C-37.4°C (97.6-99.3°F) or higher.
- Parents or legal guardians provided written informed consent for their child's participation in the study.
- Without any skin conditions, allergies, or infections that contraindicate the use of massage.
- Who are not receiving any antipyretic medication within 4 hours prior to the intervention
- **Exclusion:** Toddlers with chronic or severe medical conditions.

#### **Exclusion criteria:**

##### **Toddler's**

1. With chronic medical conditions affecting body temperature regulation.
2. With severe illnesses requiring immediate medical intervention.

### **Development And Description Of Tool**

#### **Tool Development**

Two tools were used:

1. **Socio-Demographic Data Sheet** – for parental and toddler background info.
2. **Observational Checklist & Digital Thermometer Recording** – to measure temperature before and after Tuina massage.

#### **Tool Description**

- **Section A:** Demographics (parental age, education, income, etc.; toddler's age, gender, weight, vaccination status)
- **Section B:** Digital thermometer (range 95.9°F–99.5°F) for recording temperatures.

#### **Observational Checklist**

Used to log temperature readings and massage sessions systematically.

### Validity of the Tool

Content validated by pediatric nursing experts and clinicians. Recommendations were incorporated.

### Reliability of the Tool

Tested using inter-rater reliability with Cohen’s Kappa = 0.85, indicating high agreement and reliability.

### Pilot Study

Conducted with 8 toddlers (4 per group) at Rama Hospital from 6–20 March 2025. It confirmed clarity of tools and feasibility of Tuina massage. No major changes were required. Data from the pilot was excluded from the final analysis.

### Data Collection Procedure

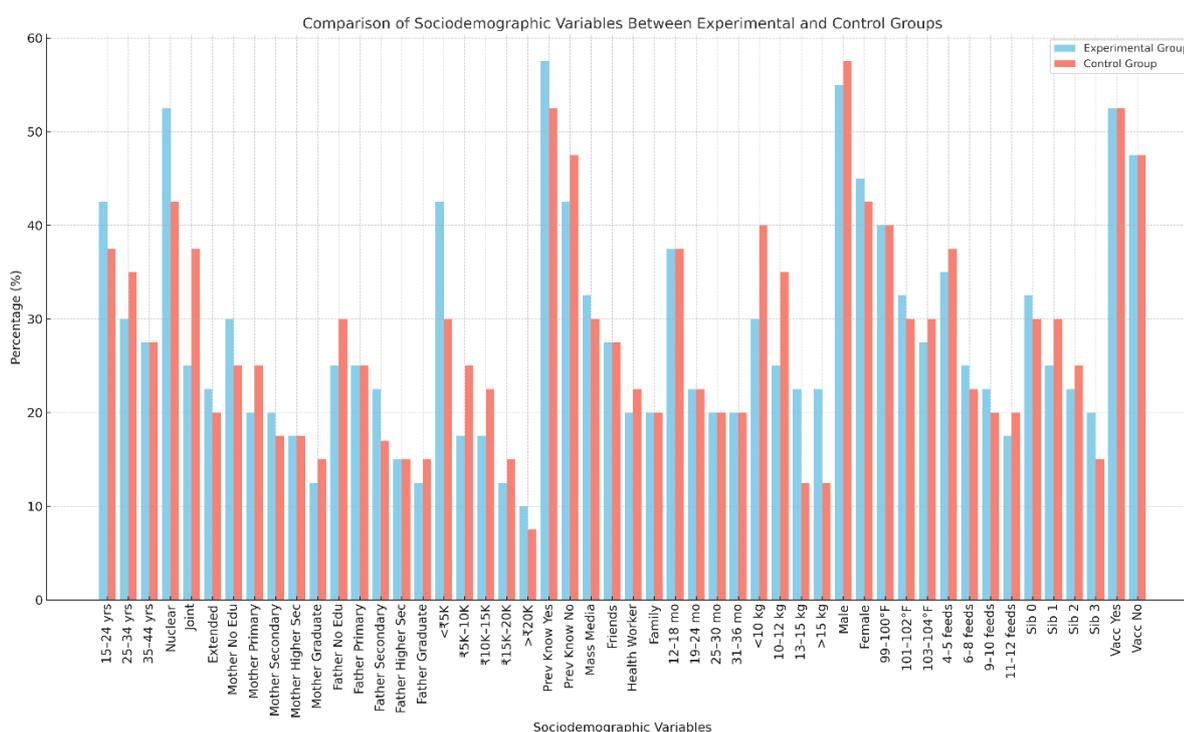
Main study conducted from 30 April to 29 May 2025. After consent, toddlers were assigned to groups via purposive sampling. Tuina massage was applied to the experimental group during episodes of fever. Body temperature was recorded before and after massage using digital thermometers. Observations were logged using structured forms and medical records.

### Plan For Data Analysis and Interpretation

- **Descriptive Statistics:** Mean, standard deviation, frequencies, and visual tools like histograms and tables were used.
- **Inferential Statistics:**
  - *Paired t-test:* to evaluate pre- and post-test changes in each group
  - *Unpaired t-test:* to compare experimental and control groups
  - *Chi-square test:* to assess associations between post-test temperature and demographic variables

### Data Analysis and Interpretation

**Figure 1: Percentage distribution of toddlers according to Demographic variable**



**Table 2: Combined Temperature Levels (Day 1–5)**

Day	Temperature Level	Experimental Group Pre (%)	Experimental Group Post (%)	Control Group Pre (%)	Control Group Post (%)
Day 1	Normal	0	0	0	0
Day 1	Mild Hyperthermia	42.5	42.5	50	60
Day 1	Moderate Hyperthermia	47.5	50	40	32.5
Day 1	Severe Hyperthermia	10	7.5	10	7.5
Day 2	Normal	0	0	0	0
Day 2	Mild Hyperthermia	50	42.5	59.5	60
Day 2	Moderate Hyperthermia	42.5	50	31	32.5
Day 2	Severe Hyperthermia	7.5	7.5	9.5	7.5
Day 3	Normal	2.5	10	0	0
Day 3	Mild Hyperthermia	52.5	60	65	65
Day 3	Moderate Hyperthermia	37.5	25	27.5	27.5
Day 3	Severe Hyperthermia	7.5	5	7.5	7.5
Day 4	Normal	15	35	2.5	2.5
Day 4	Mild Hyperthermia	65	55	62.5	62.5
Day 4	Moderate Hyperthermia	20	10	30	30
Day 4	Severe Hyperthermia	0	0	5	5
Day 5	Normal	17.5	82.5	10	10
Day 5	Mild Hyperthermia	62.5	7.5	55	55
Day 5	Moderate Hyperthermia	20	10	32.5	32.5
Day 5	Severe Hyperthermia	0	0	2.5	2.5

In the experimental group, the percentage of toddlers with normal body temperature increased steadily from 0% on Day 1 to 82.5% by Day 5, demonstrating a clear effect of Tuina massage. Simultaneously, cases of moderate and severe hyperthermia declined significantly. In contrast, the control group showed no substantial improvement in temperature status across the five days. The proportion of toddlers with normal temperature remained low (10%) by Day 5, and many continued to experience mild to moderate fever. These findings support the effectiveness of Tuina massage in rapidly reducing body temperature in toddlers compared to standard care.

**Table 3: Effectiveness of Tuina Massage Technique on Toddlers (Experimental Group)**

**n = 40**

Group	Pre-test Mean	Post-test Mean	Mean Difference	t-value	p-value	Significance
Experimental	100.3 °F	100.08 °F	0.22 °F	2.218	0.0277	Significant

The Tuina massage technique showed a significant reduction in toddlers' body temperature, decreasing from a pre-test mean of 100.3°F to 100.08°F post-test. The difference (0.22°F) was statistically significant ( $t = 2.218$ ,  $p = 0.0277$ ). Hence, the null hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_1$ ) is accepted, confirming the effectiveness of Tuina massage in reducing body temperature.

**Table 4: Effectiveness of Tuina Massage Technique on Toddlers (Control Group)**

n = 40

Group	Pre-test Mean	Post-test Mean	Mean Difference	t-value	p-value	Significance
Control	100.42 °F	100.3 °F	0.12 °F	1.237	0.2175	Not Significant

In the control group, a minor decrease in body temperature was observed (from 100.42°F to 100.3°F), with a mean difference of 0.12°F. However, this change was not statistically significant ( $t = 1.237$ ,  $p = 0.2175$ ). Therefore, the null hypothesis ( $H_0$ ) is accepted and  $H_1$  is rejected, indicating that without Tuina massage, there was no significant reduction in body temperature.

**Table 5: Association between experimental group post-test body temperature of toddlers and their selected demographic variables**  
n=40

Demographic Variable	Chi-Square Value	df	Table Value	p-value	Inference
Age of Parents	0.97	2	5.991	>0.05	NS
Type of Family	1.22	2	5.991	>0.05	NS
Mother's Education	0.51	4	9.488	>0.05	NS
Father's Education	2.65	4	9.488	>0.05	NS
Monthly Income	2.78	4	9.488	>0.05	NS
Previous Knowledge	2.76	1	3.841	>0.05	NS
Source of Knowledge	7.35	3	7.185	<0.05	Significant
Age of Toddler	4.23	3	7.185	>0.05	NS
Weight of Toddler	7.48	4	9.488	>0.05	NS
Gender of Toddler	3.23	1	3.841	>0.05	NS
Body Temp Range	2.4	2	5.991	>0.05	NS
Feeds Per Day	0.33	3	7.185	>0.05	NS
No. of Siblings	3.58	3	7.185	>0.05	NS
Vaccination Status	0.32	1	3.841	>0.05	NS

The analysis using the chi-square test showed that a significant association was found with the source of knowledge about Tuina massage ( $p < 0.05$ ). Hence,  $H_2$  is accepted and  $H_{02}$  is rejected, with source of knowledge being the only factor significantly associated with post-test temperature in the presence of Tuina massage.

**Table 6: Association between control group post-test body temperature of toddlers and their selected demographic variables**  
n=40

Demographic Variable	Chi-Square Value	df	Table Value	p-value	Inference
Age of Parents	0.03	2	5.991	>0.05	NS
Type of Family	1.25	2	5.991	>0.05	NS
Mother's Education	2.8	4	9.488	>0.05	NS
Father's Education	2.69	4	9.488	>0.05	NS
Monthly Income	0.36	4	9.488	>0.05	NS
Previous Knowledge	0.8	1	3.841	>0.05	NS
Source of Knowledge	0.06	3	7.185	>0.05	NS
Age of Toddler	0.85	3	7.185	>0.05	NS
Weight of Toddler	0.21	4	9.488	>0.05	NS

Gender of Toddler	3.91	1	3.841	<0.05	Significant
Body Temp Range	1.9	2	5.991	>0.05	NS
Feeds Per Day	1.48	3	7.185	>0.05	NS
No. of Siblings	1.47	3	7.185	>0.05	NS
Vaccination Status	0.19	1	3.841	>0.05	NS

In the control group, most demographic variable gender showed a statistically significant association ( $p < 0.05$ ), indicating a possible influence on post-test temperature outcomes. Male toddlers had more varied post-test temperatures compared to females. Hence,  $H_2$  is accepted and  $H_{02}$  is rejected, with gender being the only factor significantly associated with post-test temperature in the absence of Tuina massage

## DISCUSSION

This study evaluated the effectiveness of Tuina massage in reducing body temperature among toddlers in selected hospitals of Kanpur. Results revealed a significant reduction in body temperature in the experimental group compared to the control group over five days. By Day 5, 82.5% of toddlers in the experimental group had normal temperature compared to only 10% in the control group, confirming Tuina's effectiveness. Statistical analysis showed a mean difference of 0.22°F with a t-value of 2.218 and  $p = 0.0277$ , indicating a significant effect of Tuina massage. Supporting studies from China reported similar outcomes, highlighting its role in improving thermoregulation and circulation through stimulation of specific acupoints. In terms of demographic association, most variables showed no significant impact, except the source of knowledge ( $p < 0.05$ ) in the experimental group and gender ( $p < 0.05$ ) in the control group. This suggests that caregiver awareness and gender-based caregiving practices may influence fever outcomes. Overall, the study supports Tuina massage as a safe, cost-effective, and evidence-based non-pharmacological intervention for pediatric fever management.

## CONCLUSION

In conclusion, Tuina massage emerges as a safe, simple, culturally accepted, and effective non-pharmacological intervention to reduce fever in toddlers. It can be particularly beneficial in resource-limited settings where access to immediate pharmacological care is constrained or where caregivers prefer traditional healing practices. Integrating such evidence-based traditional techniques into pediatric nursing practice could promote holistic child health care. The study recommends the inclusion of Tuina massage education in pediatric nursing and caregiver training programs to improve home-based fever management practices

## NURSING IMPLICATIONS

### NURSING PRACTICE

- Nurses, especially those working in pediatric, emergency, and fever management units, should be trained and competent in administering Tuina massage as a non-pharmacological technique for reducing elevated body temperature in toddlers.

### NURSING EDUCATION

- Tuina massage technique should be incorporated into pediatric and child health nursing curricula as a relevant non-pharmacological intervention for managing mild to moderate hyperthermia in toddlers.

### NURSING RESEARCH

- Further research can be undertaken to compare the effectiveness of Tuina massage with other complementary therapies like tepid sponging, aromatherapy, or acupressure in reducing fever among toddlers.

### NURSING ADMINISTRATION

- Pediatric ward protocols should promote the integration of evidence-based, non-pharmacological methods such as Tuina massage for the management of mild to moderate hyperthermia in toddlers.

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