

Application of tactile/kinesthetic stimulation in preterm infants: a systematic review

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About me

✓ Physical Therapist (2002)

✓ Osteopathy (2007)

✓ Enhancing Manipulative Skills – Dra Viola Frymann (2007)

✓ Private practice with babies

The first little baby

- ✓ Born premature
 - ✓ After no consideration
- gastroesophageal reflux started to

*Mother:
"Now what? And the children who are in the NICU? Vain all do surgery?"*

Literature review

Resume

- ✓ Objective
- ✓ Method
- ✓ Inclusion criteria
- ✓ Results
- ✓ Conclusion

Introduction

TKS has been studied as an aid to standard treatment



Growth and Development
minimizing stress

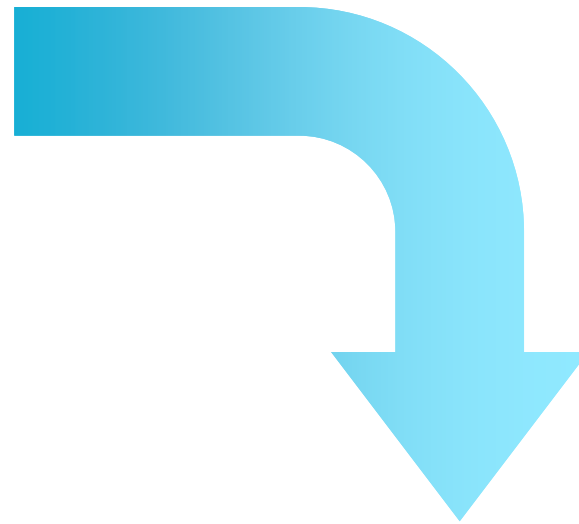
Benefits

- ✓ Increased weight gain 3,6-10,14-37,39
- ✓ Reduced length of hospital stay 10,16,17,20,21,23,24,28,31,32,35,37,39
- ✓ Reduced stress behaviors¹¹
- ✓ Improved neurobehavioral responses 6-8,10,14,19-23,25,26,36,39
- ✓ Reduced Late-onset sepsis 16
- ✓ Effect on the immune system 32

THERE IS A POTENCIAL FOR SEVERAL BENEFITS THROUGH THIS TECHNIQUE

The Technique

- ✓ Simple procedure
- ✓ Low cost
- ✓ Non-invasive



Still need more studies

Objective

*To verify the **methods** used by the clinical trials that assessed the effect of tactile/kinesthetic stimulation on weight gain in preterm infants and highlight the **similarities** and **differences** among such studies*

Method

Systematic Review

2 databases: PEDro and PubMed (July-2014)

- 1) Title
- 2) Abstract
- 3) Texts



BIBLIOGRAPHIES

(thoroughly read to select those that met the inclusion criteria)

Method

PubMed: 6 keywords combinations

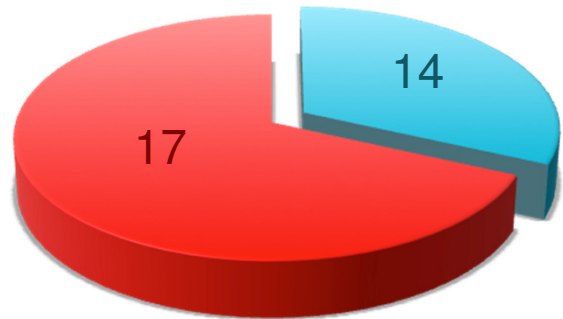
- *Search 1*: massage premature newborn
- *Search 2*: tactile kinesthetic stimulation premature
- *Search 3*: tactile stimulation premature
- *Search 4*: massage premature growth
- *Search 5*: kinesthetic stimulation premature growth
- *Search 6*: tactile kinesthetic stimulation premature growth

Inclusion Criteria

- ✓ Clinical trials **TS** or **massage therapy** whether or not associated with **KS** of **PI**
- ✓ That assessed **weight gain** after the intervention
- ✓ **Control group**
- ✓ Were composed in English, Portuguese, or Spanish

Title/Author/Year/Dat abase	Sample Size	Objectives and starting conditions	Description of the technique	Main variables	Measured weight gain	Description of adverse events during the procedure	Results achieved statistical significance
<p><i>Massage therapy improves neurodevelopment outcome at two years corrected age for very low birth weight infants</i>³⁶ Procianoy et al., 2010 PubMed searches 1, 4</p>	<p>Total: 73 TG: 35 GAM= 30 w BWM= 1192g CG: 38 GAM= 29.7w BWM= 1151g both groups Skin-skin care</p>	<p>Assess the outcome of MT growth and neurodevelopment of PI assessed at 2 years corrected age. Beginning after 48 h of life.</p>	<p>MT applied only by mothers, 4x/day for 15 min, intervals of 6 hours of TS: temporal, frontal, periorbital, nasal, and perilabial regions of the face and the external side of the upper and lower limbs + KS (3x each: wrist, elbow, ankle, and knee)</p>	<p>1)Anthropometric 2) Bayley scales of infant development, second edition (BSID-II) Measured at 2 years of corrected age</p>	<p>Body weight taken with normal nursery routine</p>	<p>Mothers of the TG were instructed to observe the newborns' tolerance signs, avoiding excessive stimulations.</p>	<p>2) TG: Greater mental development index (p = 0.035)</p>

Results



Making the revision we have seen that a lot of studies (14 of 31) follow the protocol proposed by Dr. Field in 1986

Tactile Kinesthetic Stimulation

FASE 1

- Tactile stimulation
- Prono position

FASE 2

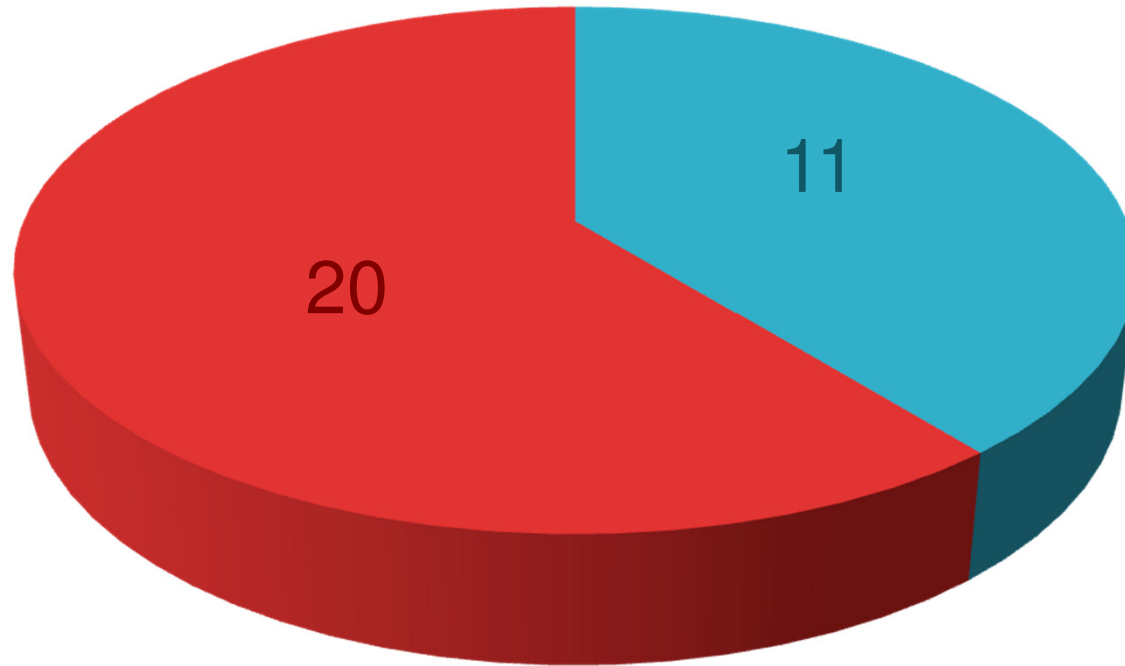
- Kinesthetic stimulation
- Supine position

FASE 3

- Tactile stimulation
- Prono position



Results



20 of the 31 studies^{3,10,14,15,17-19,21-32,34} described a **SIGNIFICANTLY BENEFIT ON WEIGHTT GAIN** in the PI group that received the TS/TKS

Correlations faster weight gain and TKS

✓ *Increase in insulin levels and insulin-like growth factor-1 (IGF-1)* ³⁰

✓ *Greater vagal stimulation* ^{28,29}

✓ *Greater gastric activity* ^{28,29}

✓ *More relaxed → Lower heart rates → Lower energy expenditure → Faster weight gain*

Analyzing the Technique

Older studies: did not specify

- ✓ Which parts of the body were stimulated or how often
- ✓ The pressure used during the intervention and its duration

Analyzing the Technique

- *White & Labarba (1976)* were the first to combine TS and KS
- In 1981, *Rausch* divided TKS into 3 phases of 5 min but applied TKS only when the PI were awake, without changing their position in the incubator
- *Scafidi et al* standardized the three 5 min phases into prone TS + supine KS + prone TS

Analyzing the Technique

- Some studies used some type of **oil** to reduce friction on the PI's skin^{14,17,33-35}
- *Ferber et al*¹⁵ suggested that during the **first 10s** of TS, the caregiver should **only rest his hand** on the PI, avoiding movements
- *Dieter et al*²⁷ was the first to provide **TKS for only 5 days**

Analyzing the Technique

- *Diego et al*²⁸ show that moderate pressure promoted better outcomes than the group who received light pressure
- Also, in another time, trained a few therapists and suggested that the technique was effective, regardless of therapist
- *Massaro et al*³¹ tested TKS and TS separately in different groups of infants and found that TKS appears to be better

Adverse Events

INTERRUPT THE PROCEDURE

- ✓ Stress or uninterrupted crying for more than 60s²⁶
- ✓ Defecation¹⁴
- ✓ Increased heart rate >200 ^{19,27}
- ✓ Decrease heart rate <100 for 12s^{19,27}
- ✓ Oxygen Saturation level less than 90% for more than 30s¹⁹

Adverse Events

*Some authors considered some **signs in the 24 hours that preceded the intervention** to suspend the procedure*

- ✓ Fussing
- ✓ Vomiting
- ✓ Growing oxygen demand
- ✓ Frequent episodes of apnea
- ✓ Bradycardia
- ✓ Desaturation
- ✓ Interventions conducted within the 30min that preceded TKS, such as **sight and hearing tests**¹⁸

Analyzing the technique

Most of the studies **did not** provide a detailed description of **how to proceed** during the stimulation if **adverse events** occur, nor **which are** and **neither of the possible effects** of these events on the outcomes

Adverse Events

Exchange of
oximeter

Use of
pacifiers

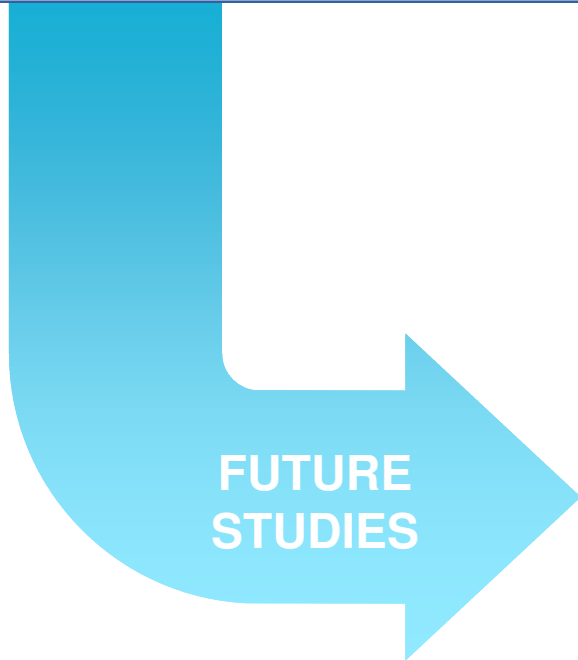
Routine
medical
examination
just before
the
procedure

Diaper

Some other
position to
calm the
baby

CONCLUSION

- Benefits of TKS*
- No protocol if adverse events occur*
- Various ways to apply technique*



- Following protocols*
- Raise the level of methodological rigor*
- Describe the adverse events that can occur during the procedure*

SMALL CHANGES CAN LEAD A BIG DIFFERENCE

QUALITY OF LIFE



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