



# Infant positioning in daily life may mediate associations between physiotherapy and child development—video-analysis of an early intervention RCT



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## ABSTRACT

**Background:** Paediatric physiotherapy (PPT) in high-risk infants comprises family involvement, but it is unclear whether parents mediate the intervention effect. We demonstrated in a randomized controlled trial in high-risk infants comparing the family centred programme Coping and Caring for infants with special needs (COPCA) and Traditional Infant Physiotherapy (TIP) that process evaluation revealed associations between COPCA-characteristics and outcome.

**Aims:** To assess whether PPT affects how parents position their infant during bathing and whether this is associated with child outcome.

**Methods and procedures:** 21 infants received COPCA and 25 TIP between 3 and 6 months corrected age. Bathing sessions were videotaped at 3, 6 and 18 months. Time spent with specific infant positions was correlated with quantified PPT-actions and functional mobility at 18 months measured with the Paediatric Evaluation of Disability Inventory (PEDI).

**Outcomes and results:** At 3 and 18 months bathing position was similar in both groups, but differed at 6 months (time spent on sitting: COPCA 77.7%, TIP 39.2%; median difference 32.0% (95% CI: 10.6–50.5%). Sitting-time at 6 months was associated with higher PEDI functional mobility scores.

**Conclusions and implications:** Early PPT may affect parental behaviour, such as infant positioning during bathing, which, in turn, may affect child development.

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## 1. Introduction

### 1.1. Family involvement in infant physiotherapy

It is generally recognized that family-centred practices and care are of crucial importance in early intervention of children with or at risk for neurodisability (Dunst, Trivette, & Harmby, 2007; Mihee & Palisano, 2014; Rosenbaum, 2011). From its very beginning early intervention involved parents in therapeutic guidance. Initially physiotherapy providers primarily focused on working directly with the child. Gradually, the needs of the family members and the environment were incorporated in a family-focused orientation. Concurrently, the relationship between physiotherapist and parent changed. It changed from guidance which was professionally directed to coaching based on equal partnership (Moore, 2008). Nevertheless, in the most frequently applied early physiotherapy intervention programmes for infants aged 0–2 years at high risk for cerebral palsy (CP) family involvement in service delivery is still diverse (Dirks & Hadders-Algra, 2011). This diversity matches the heterogeneity in parental participation in physiotherapy of children with physical disabilities reported by Jansen, Ketelaar, and Vermeer (2003).

In order to improve our understanding of the role of the family in early physiotherapy intervention, we had conducted the Vroege Interventie Project (VIP; Dutch for Early Intervention Project) in the past years, a randomized controlled trial (RCT) to study the effect of a family centred programme in young high-risk infants compared to that of traditional infant physiotherapy.

### 1.2. The VIP project

The VIP-project was a RCT on the effect of early paediatric physiotherapy (PPT) on the development of infants at high risk for neurodevelopmental disorders (Blauw-Hospers, Dirks, Hulshof, Bos, & Hadders-Algra, 2011; Hielkema et al., 2011). One trial group had received the new family centred PPT programme COPing with and CARing for infants with special needs (COPCA; Dirks, Blauw-Hospers, Hulshof, & Hadders-Algra, 2011). The other group had received traditional infant physiotherapy (TIP). TIP in the Netherlands is mainly based on the principles of neurodevelopmental treatment (NDT) (Bly, 1999; Howle, 2002). Both programmes differ largely in contents but they share the goal to encourage family members to integrate newly acquired knowledge into activities of daily life (Dirks & Hadders-Algra, 2011). Major differences between COPCA and TIP consist of (a) the approach of the family, which in COPCA implies coaching and in TIP more often teaching and instruction, and (b) the implementation of neuromotor actions that in COPCA much more than in TIP consist of challenging the infant to explore by itself its motor actions at the verge of its possibilities. In COPCA, the latter includes positioning of the young infant in the challenging position of sitting, preferably with relatively little postural support (Dirks et al., 2011).

The randomized intervention was applied between the ages of 3 and 6 months corrected age (CA). Outcome was evaluated with a comprehensive assessment battery during and immediately after the intervention and once again at 18 months CA. Data analysis revealed – at RCT level – a minimal advantage in cognitive development at 18 months for the COPCA-group (Blauw-Hospers et al., 2011). We had anticipated that the difference in developmental outcome of the two randomized groups would be minor at best, as we were aware that the heterogeneity with which PPT in general is applied presumably would cause overlap in PPT contents of the two intervention programmes. In anticipation, we therefore had video recorded PPT sessions. The quantitative analysis of the PPT sessions confirmed the hypothesis of overlap in PPT contents in the two randomized groups (Dirks et al., 2011). In addition, the quantified PPT information allowed for process evaluation. This evaluation showed that (a) COPCA characteristics, such as family involvement and coaching of family members (Hamlin, Ellinger, & Beattie, 2009), were associated with higher scores of functional mobility at 18 months, and (b) the use of therapeutic handling, a characteristic of TIP, was associated with lower functional mobility scores (Blauw-Hospers et al., 2011).

### 1.3. Infant bathing

Infant bathing is one of the specific points of attention of postpartum nursing practice aiming to inform parents how to support and position the infant in a safe way. With the increase in family centred care, infant bathing also became an important issue in early intervention and PPT care delivery (Karl, 1999).

### 1.4. Aim of the study and specific questions addressed

The aim of the study was (1) to investigate whether the PPT programmes evaluated in the VIP-project, i.e., COPCA and TIP, affected parental caregiving behaviour in terms of infant positioning during the daily activity of infant bathing and (2) to evaluate whether infant positioning during bathing was associated with functional mobility at 18 months. To this end we analysed video-recordings of infant bathing sessions at home that were made in the VIP-project at baseline (3 months CA), immediately after the intervention at 6 months CA, and at 18 months CA.<sup>1</sup> These videos were used to address the following specific questions:

<sup>1</sup> All ages further mentioned in the paper are corrected ages; this will no longer be mentioned explicitly.

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