

PhD thesis

**Spinal pain in Danish school children
Epidemiology and manipulative therapy**



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Summary English

There is increasing evidence that spinal pain (i.e. back- and/or neck pain) in children and adolescents is a common condition but usually transient and inconsequential for most children and rarely associated with serious pathology. However, there seems to be a considerable subgroup of children with recurrent and bothersome spinal pain that is in need of more attention. This is especially important considering the fact that the lifetime prevalence increases steadily to reach adult levels around the age of 18 and that children with spinal pain are more likely to become adults with spinal pain. Despite increasing knowledge, there is still a lack of research, both in relation to occurrence and to efficient treatment strategies, necessitating longitudinal studies in this area.

Today, no 'gold standard' treatment for spinal pain in children exists, but manipulative therapy is increasingly being used in spite of a lack of evidence of its effectiveness. Instead, management of children's health relies to a large extent on parents' values, preferences and experience, and healthcare professionals have to depend on guidelines developed for adults.

The overall aims of this thesis were to explore the magnitude of spinal pain in Danish school children, particularly duration and frequency, and to evaluate the effectiveness of manipulative therapy in addition to other types of conservative care in the treatment of this spinal pain. In addition, the effect of potentially modifying factors was explored.

This thesis is based on data from a 3-year longitudinal school-based open cohort study, the CHAMPS Study-DK. The outcomes were based on weekly text messages (SMS) to one of the parents inquiring about the child's musculoskeletal pain, and on clinical data from examinations of the children. A two-arm pragmatic randomised controlled trial was conducted to determine the effectiveness of manipulative therapy when added to other types of conservative care. Interventions included either 1) advice, exercises, and soft tissue treatment (control), or 2) advice, exercises, and soft tissue treatment *plus* manipulative therapy (intervention).

This study demonstrated that spinal pain is a rather substantial problem. Most episodes are brief, but there are a vast number of children with frequent and long-lasting episodes of spinal pain. In at least a quarter of those with spinal pain, the episodes lasted for more than four weeks and/or occurred three times or more during a school year.

We found no significant difference in the number of recurrences of episodes of spinal pain when adding manipulative therapy to other conservative treatment, but children in the manipulative therapy group had a higher Global Perceived Effect. In the subgroup analyses, we found weak tendencies supporting our hypotheses about a greater chance of improvement in response to manipulative therapy in the most affected children regarding duration and frequency, whereas the least affected children showed no or even negative response if they were randomised to manipulative therapy.

Future research should focus on evidence-based prevention and efficient treatment regimes for the most affected children. Furthermore, a more qualitative approach should be incorporated into future trials and self-reported outcomes measuring improvement in children should be validated.

Dansk resumé

Der er stigende evidens for, at ryg- og nakkesmerter (lænde-, bryst- og/eller nakkesmerter) hos børn og unge er en almindeligt forekommende tilstand, oftest forbigående og uden større betydning. Der synes dog at være en større gruppe børn, som har tilbagevendende og mere generende ryg- og nakkesmerter, og denne gruppe bør få mere opmærksomhed. Dette er især vigtigt, da livstids prævalensen stiger jævnt med alderen og nærmer sig voksen niveau omkring 18-års alderen og børn med rygsmerter har større sandsynlighed for at udvikle sig til voksne med rygsmerter. På trods af øget viden på området, er der stadig behov for forskning, både i forhold til omfanget af ryg- og nakkesmerter og effektive behandlingsstrategier.

Der eksisterer i dag ingen 'gold standard' behandling af ryg- og nakkesmerter hos børn, men manipulationsbehandling bliver anvendt i stigende omfang på trods af manglende evidens af effekten. Håndtering af børns sundhed afhænger i høj grad af forældres værdier, præferencer og erfaring, og sundhedsfagligt personale er nødt til at læne sig op ad retningslinjer udviklet for voksne.

Det overordnede formål med denne afhandling var at beskrive omfanget af ryg- og nakkesmerter hos danske skolebørn, især i forhold til varighed og hyppighed, samt at vurdere den additive effekt af manipulationsbehandling til anden konservativ behandling heraf. Derudover ville vi undersøge effekten af potentielle modificerende faktorer.

Denne afhandling er baseret på data fra et 3-årigt longitudinelt skolebaseret åbent kohorte studie, CHAMPS-Study DK. Effektmålene var baseret på ugentlige SMS spørgsmål sendt til en af forældrene, hvor de blev spurgt om barnet havde haft nogen muskuloskeletale gener i den forgangne uge, samt på data fra kliniske undersøgelser af barnet. En pragmatisk randomiseret kontrolleret undersøgelse blev gennemført for at vurdere effekten af manipulationsbehandling tilføjet til anden konservativ behandling. Interventionen inkluderede enten 1) rådgivning, træning og bløddelsbehandling (kontrol gruppe) eller 2) rådgivning, træning og bløddelsbehandling *plus* manipulationsbehandling (interventions gruppe).

Dette studie konkluderer, at ryg- og nakkesmerter er et substantielt problem. De fleste episoder er korte, men der er en større gruppe børn med hyppige og længerevarende episoder med ryg- og nakkesmerter. Hos mindst en fjerdedel af dem med ryg- og nakkesmerter varede episoderne i mere end fire uger og/eller forekom tre eller flere gange indenfor et skoleår.

Vi fandt ingen signifikant forskel i antallet af tilbagefald med ryg- og nakkesmerter ved at tilføje manipulationsbehandling til anden konservativ behandling, men børnene i manipulationsgruppen havde bedre 'Global Perceived Effect'.

Subgruppe-analyserne viste svage tendenser til understøtning af vores hypotese; at de mest påvirkede børn ville have større effekt af manipulationsbehandling, hvorimod de mindst påvirkede børn havde enten ingen eller dårligere effekt hvis de fik manipulationsbehandling.

Fremtidig forskning bør fokusere på at øge vores viden omkring evidens baseret forebyggelse og effektive behandlings strategier de mest påvirkede børn for. Endvidere bør der inkorporeres en mere kvalitativ tilgang i kommende undersøgelser og effektmål omkring forbedring bør valideres på børn.