Omega-3 DHA and sleep in UK children: Results from the DOLAB study.

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Introduction

Good sleep quality and duration are essential for children's learning and behaviour.

Past research
Fatty acid (LC-PUFA) metabolites play a role in sleep regulation and fatty acid supplementation may reduce anxiety effects of sleep deprivation.

However, little is known about the effect of the LC-PUFA DHA Omega-3 on sleep in children.

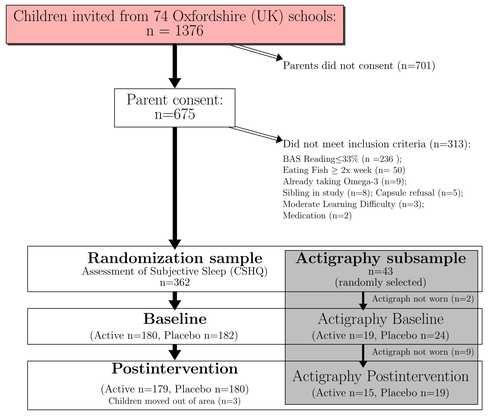
Research Question

- Does supplementation with DHA Omega-3 change the quality, duration and timing of children's sleep.

Methods

The DHA Oxford Learning and Behaviour Study (DOLAB) is a randomized, double-blind, placebo-controlled trial.

Participants
Children aged 7-9 from mainstream schools, underperforming in literacy skills according to nationally standardised assessments (KS1) were invited. NHS ethics as well as parental consent and child assent was obtained.



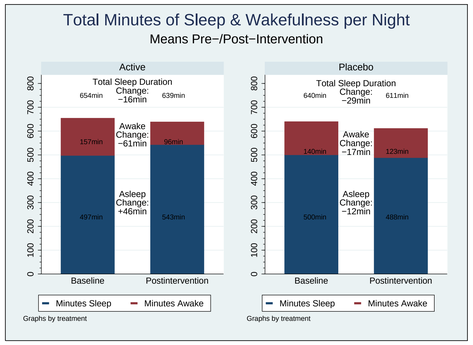
Intervention
Supplementation with DHA (600mg/day for 16 weeks) with a control group receiving a soy/corn oil placebo.

Outcomes

1. **Subjective sleep:** Measured using the Child Sleep Health Questionnaire, with eight sub-scales and one total sleep disturbance score.
2. **Objective sleep:** Children in a subsample (15%) were assessed using an actigraph during five consecutive nights at baseline and follow-up.
(More details in separate box *Actigraphy*).

Improvements in Objective Sleep (Actigraphy) Following Supplementation with DHA Omega-3

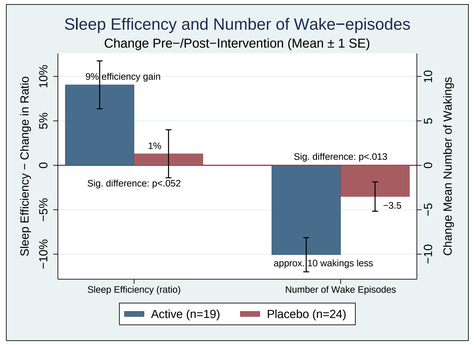
Change in Amount of Sleep and Wakefulness at night



On average, children who received DHA during the 16-week intervention, compared to those who did not:

- Spent **44min less awake** during an average night.
- Got **58min more sleep** per night.

Change in Sleep Efficiency & Number of Night-wakings

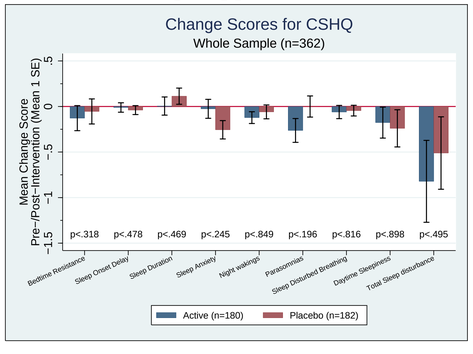


In addition, children in the intervention group, compared to the placebo group:

- **Gained 8% sleep efficiency** (sleep during time in bed).
- Had **7 fewer wake episodes** per night, (brief wakings).

Supplementation, Subjective Sleep (CSHQ) and Clinical Relevance

Change in Subjective Sleep (CSHQ) following Supplementation

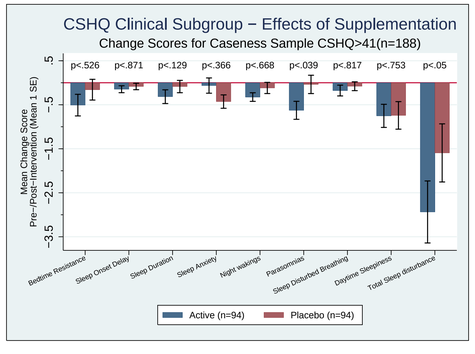


The Child Health Questionaire (CSHQ) measures subjective sleep quality.

A "*Total Sleep Disturbance*" score >41 is used to diagnose clinical sleep problems.

No significant improvements in parents' perceptions of sleep were found across the subscales of the CSHQ.

Improvements in a Clinical Subgroup of children with sleep problems



A post-hoc analysis of children with clinical sleep problems shows some improvements.

Total Sleep Disturbance: Children had significantly lower scores if they received the DHA supplement.

Parasomnia: Parents of children in the active group mentioned fewer parasomnias (e.g. sleepwalking).

Acknowledgements:
Funding was provided by **DSM Nutritional Products**, who also provided the product **(DHA-S)** and placebo.
Thanks also goes to the **Waterloo Foundation** who supported Dr Richardson's work in this area of research.

Actigraphy: How to measure sleep objectively?

MicroMini-Motionlogger®, Ambulatory Monitoring Inc.

What is an Actigraph?
Actigraphs are small, watch-sized movement sensors, worn on the wrist or ankle (see picture).

How do Actigraphs work?
Actigraphy assesses sleep by measuring movement during time in bed.
A sensor logs the frequency and pattern of movement, which allows the detection of basic sleep-wake patterns.

How well does Actigraphy measure sleep?
Actigraphy sleep measures correlate with the best measures of sleep from clinical polysomnography to about 80%.

Conclusions

Results:
The analyses of subjective and objective sleep as secondary outcomes of the DOLAB STUDY suggest that:

- **DHA supplementation improves the quality of child sleep.**

Children taking DHA had less wake episodes per night and received on average 58mins more sleep.

After supplementation children and gained 8% sleep efficiency.

Relevance:
Post-hoc analyses suggest that with regard to subjective sleep:

- **Children with clinical sleep problems might particularly benefit from DHA supplementation.**

Future Research:
These exploratory analyses give good grounds for future research into LC-PUFA as a cheap and safe treatment for sleep problems.

- **Future studies should focus on children with poor sleep outcomes as these might benefit most.**