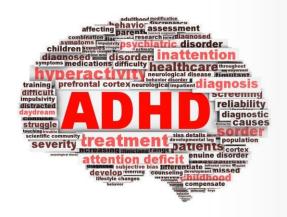
Dietary factors in attention deficit/ hyperactivity disorder



Klaus W. Lange

University of Regensburg

Department of Experimental Psychology

Chair of Biological, Clinical and Neuropsychology









Impaired sustained attention

Behavioral hyperactivity



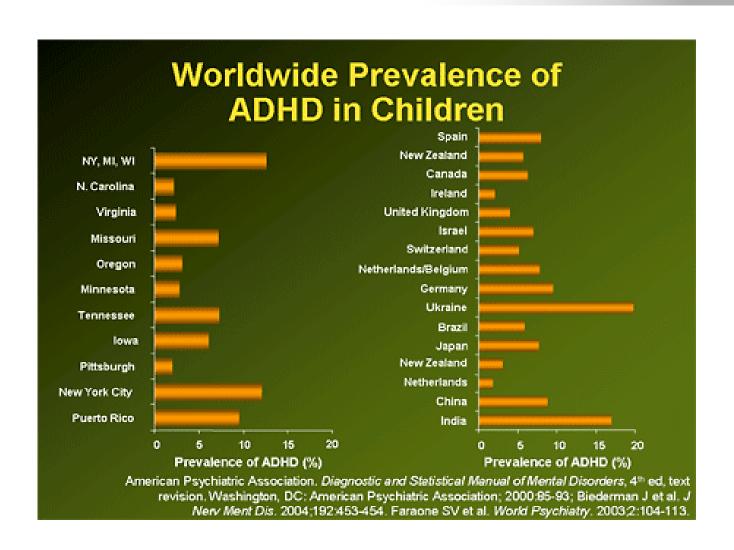






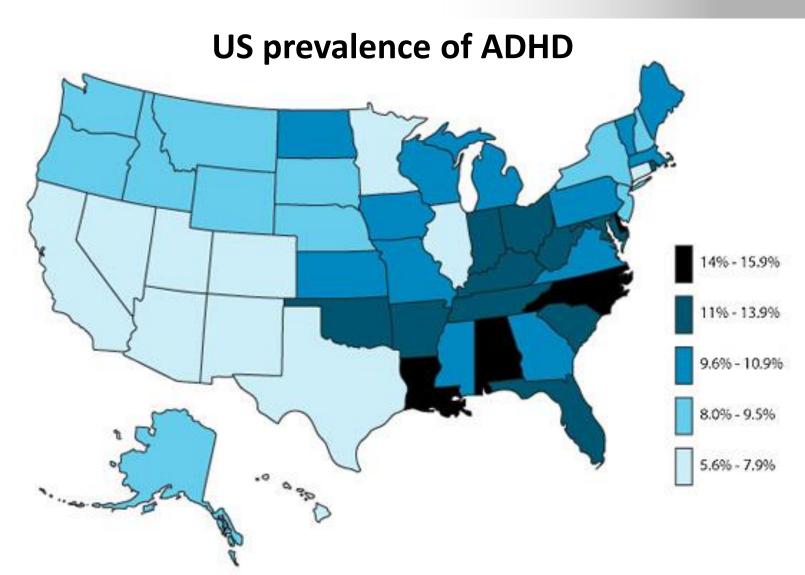
















ADHD = several disorders of different etiologies?

Inattention without hyperactivity/impulsiveness (ADD)

Impulsiveness, impaired sustained attention and hyperactivity (ADHD)

555555





Etiology of ADHD

Genetic factors

Environmental factors (e.g. maternal smoking, institutional care)

Adverse experiential factors (e.g. premature birth)

Dietary factors





Dietary factors in the etiology of ADHD

Food sensitivities

Artificial food additives

Free fatty acid deficiency

Trace element deficiency

"Western" style diet

Poor nutrition







Dietary therapy of ADHD

Food sensitivities



Restricted elimination diets

Artificial food additives



Artificial food colour exclusion

Free fatty acid deficiency



> Free fatty acid supplementation









Free fatty acids in the brain

Brain growth and development

Influence on numerous neuronal processes, e.g. expression of proteins involved in signal transduction, neural plasticity and learning

Modulation of neuronal membrane which can influence membrane receptors, neurotransmission and signal transduction











Statistical significance ≠ Clinical relevance





What is effect size?

Standardised mean difference

is a widely used measure of effect size,

states how many standard deviation units difference exist between two conditions,

is independent of the scales being used,

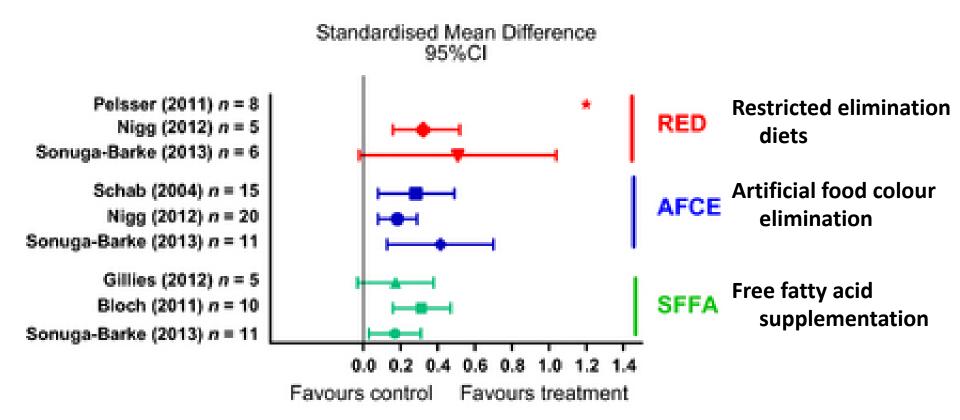
can be calculated as Cohen's d.







Meta-analysis effect sizes for dietary treatments of ADHD







Problems of dietary intervention studies

Selection of participants

Cross-over and parallel group randomized controlled trials

Choice of placebo

Blind assessment of outcome

Outcome measurement (behaviour scales, neuropsychological tests, reports from parents/teachers/others)

Outcome selection bias (multiple scales and observers)

Long-term outcome

Adverse effects of dietary treatment

Publication bias





Summary

Restricted elimination diets

may be beneficial for children with a history of adverse reactions to food

Artificial food colour exclusion

may be beneficial for children that adversely react to food colours

Free fatty acid supplementation

average effect size of three studies 0.2 i.e. small effect





Future directions

Large-scale randomized controlled trials

No selection of children with ADHD on the basis of previous responses to food stuffs

Blind assessment of children's behaviour

Control for non-specific treatment effects





"Omega-3" Fish Fingers











Definition of Functional Food

Functional Food is a natural or processed food that contains known or unknown biologically active compounds, which, when in defined quantitative and qualitative amounts, provides a documented health benefit and as a result, becomes an important source in the prevention, management, and treatment of chronic diseases of the modern age.

Functional Food Center/Functional Food Institute















