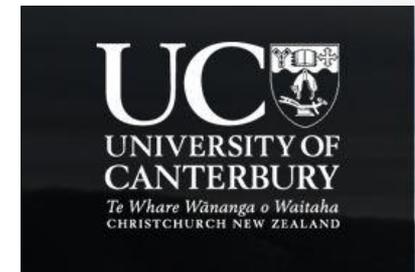


EFFECTS OF MICRONUTRIENTS ON ANXIETY AND STRESS IN CHILDREN

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Abstract

- **Objective:** Examined effects of micronutrients on children with clinically elevated stress and anxiety 23 to 36 months after experiencing a natural disaster (major earthquake).
- **Methods:** A single-case design allocated 14 children (7 males, 7 females; aged 8-11 years; 10 with formal anxiety-disorder diagnoses) randomly to one, two or three week baselines. Participants then took eight capsules/day of a micronutrient formula (EMPowerplus) during an eight-week open-label trial. Assessment instruments were the Children's Global Assessment Scale (CGAS), the Screen for Child Anxiety Related Emotional Disorders (SCARED), the Pediatric Emotional Distress Scale (PEDS), and the Revised Children's Manifest Anxiety Scale (RCMAS).
- **Results:** Symptom severity declined slightly in baseline for some children and declined much more during intervention for all children. Effect sizes at end of treatment were -1.40 (RCMAS), -1.92 (SCARED), +1.96 (CGAS) and -2.13 (PEDS). Modified Brinley plots revealed decreases in anxiety and improvements in overall functioning for 10 out of 11 completing participants. Side effects were mild and transient.
- **Conclusions:** The study provided evidence that dietary supplementation by micronutrients reduces children's post-disaster anxiety to a clinically significant degree. Future placebo-controlled randomised-controlled trials and treatment-comparison research is recommended to determine if this is true of anxiety in general.

Christchurch 22nd February 2011



Background

Anxiety is exacerbated in children following natural disasters

- Bushfires
 - Cyclones/hurricanes
 - Earthquakes
 - Tsunami
-
- For some children, acute post-disaster anxiety becomes chronic

[see La Greca, et al., 2002, for a review]

Treatment of post-disaster anxiety in children

- Pharmacotherapy – little evidence for effectiveness in children
- Trauma-focussed CBT is effective, but access difficult, especially post-disaster
- WE NEED ADDITIONAL TREATMENTS (La Greca, et al., 2002)

Nutrition as therapy

Nutritional supplementation with micronutrients (EMPower+) was effective in adults:

- Post-EQ, for those with pre-existing ADHD
- Post-EQ, for members of the general Christchurch community
- Post flood, for members of the Calgary community

- Positive effects for community adults shown @ follow-up for Christchurch community sample

SO - DO MICRONUTRIENTS BENEFIT CHILDREN?

Method

Participants

- Inclusion criteria
 - 8 – 11 years old
 - Exposed to Christchurch EQ sequence
 - Medication free
 - Score >24 on SCARED
- Recruited
 - N = 14
 - Mean age 9.4 years
 - 7 girls, 7 boys
 - 10/14 met DSM-IV diagnoses for Anxiety Disorder [K-SADS]
 - 11/14 parents had sought professional help for child's anxiety
 - Separation Anxiety and General Anxiety Disorder most common diagnoses; one had PTSD

Measures

Clinician rating:

- *Children's Global Assessment Scale (CGAS)*

Parent ratings:

- *Screen for Child Anxiety Related Disorders (SCARED)*
- *Pediatric Emotional Distress Scale (PEDS)*

Child self-report:

- *Revised Children's Manifest Anxiety Scale (RCMAS)*

Procedure

Face-to-face meetings with parent(s) and child:

1. Initial meeting

- Consent & assent obtained (Baseline measure #1)
- Full assessment battery completed
- Baselines of 7, 14, & 21 days randomly assigned

2. @ end of baseline

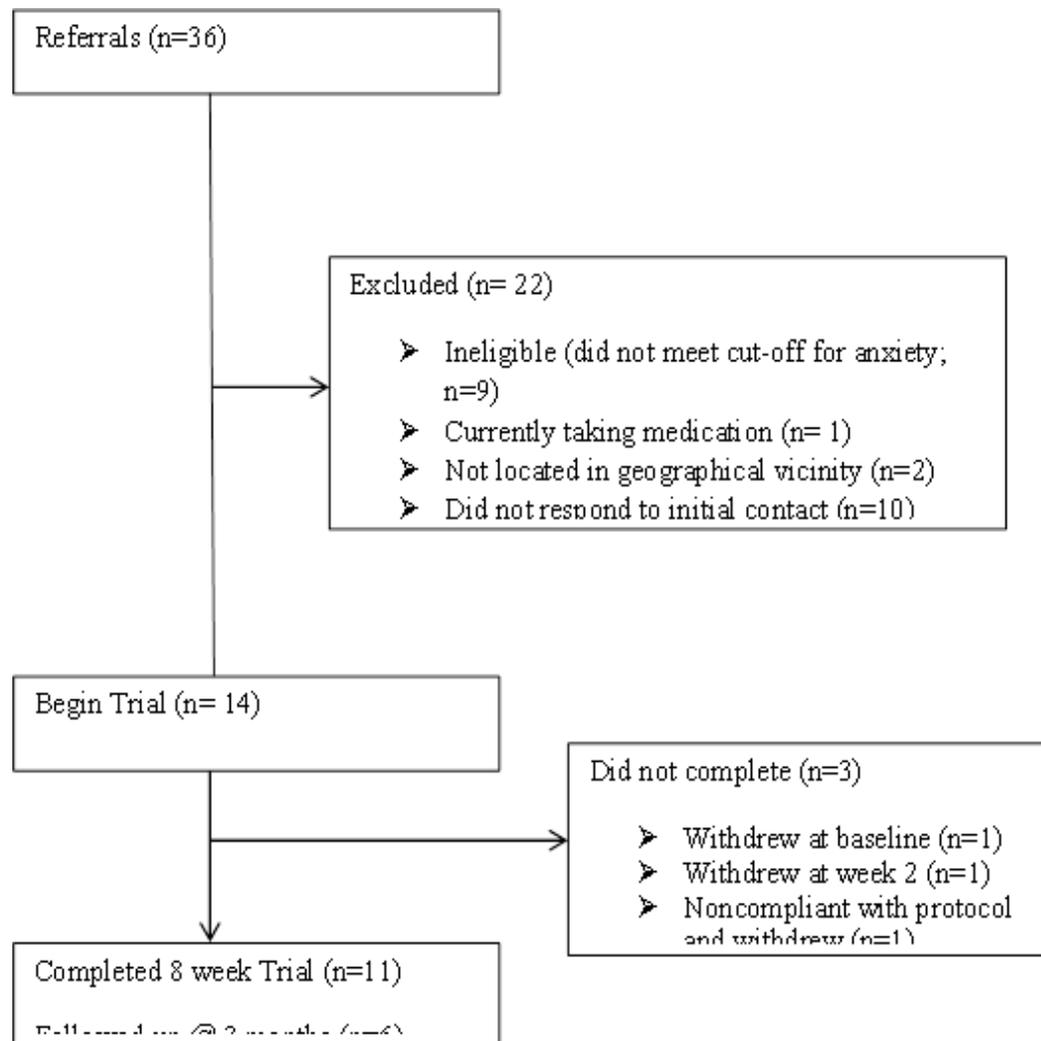
- Assessment battery completed (Baseline measure #2)
- Given EMP+ with instructions for taking it
- Dose titrated up to 8 caps/day (2x4) over 3 days

3. Treatment Weeks 2, 4, 6, 8:

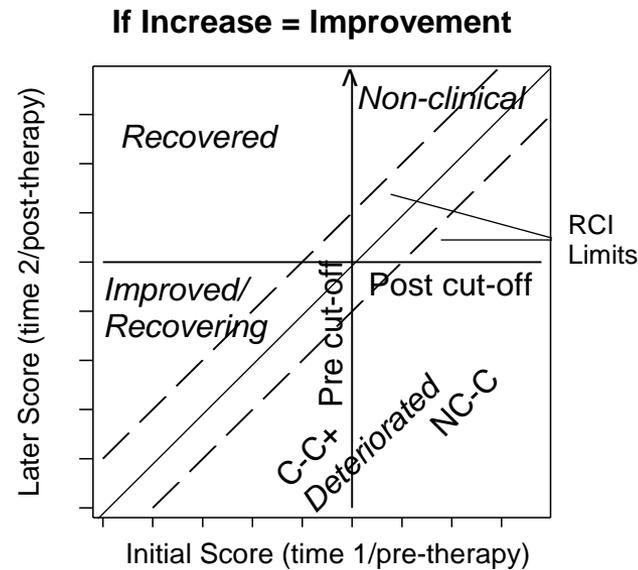
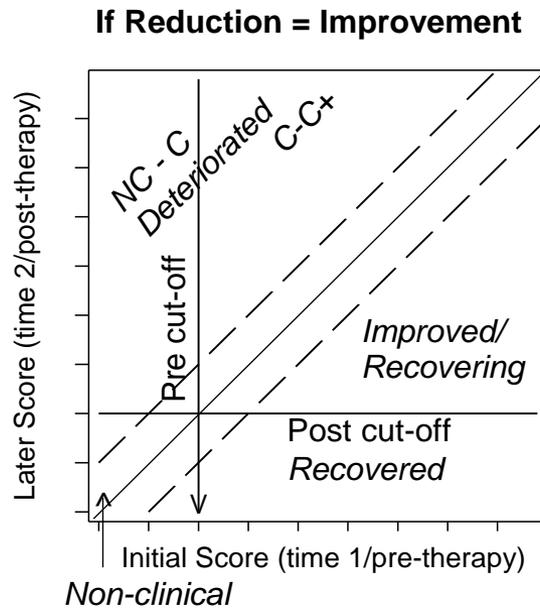
- CGAS, SCARED, PEDS, RCMAS completed (Treatment measures)
- Safety, side-effects, compliance

4. Follow- up @ 3 months (Follow-up measures)

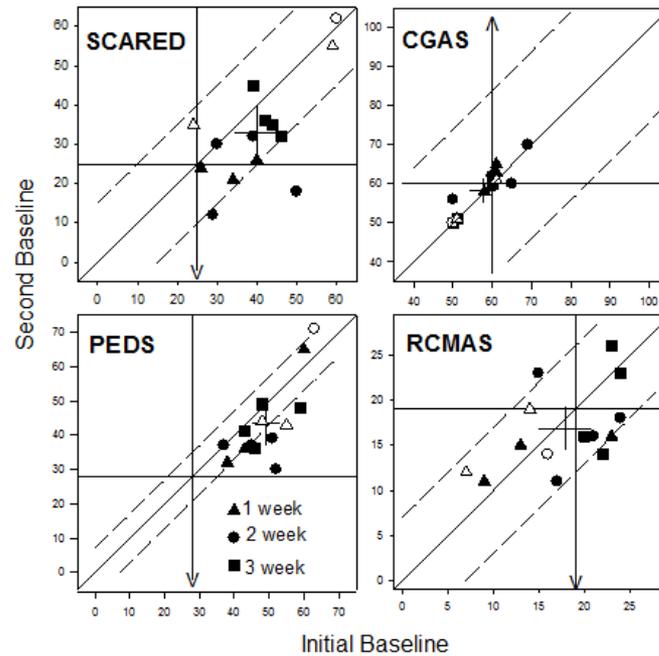
CONSORT diagram



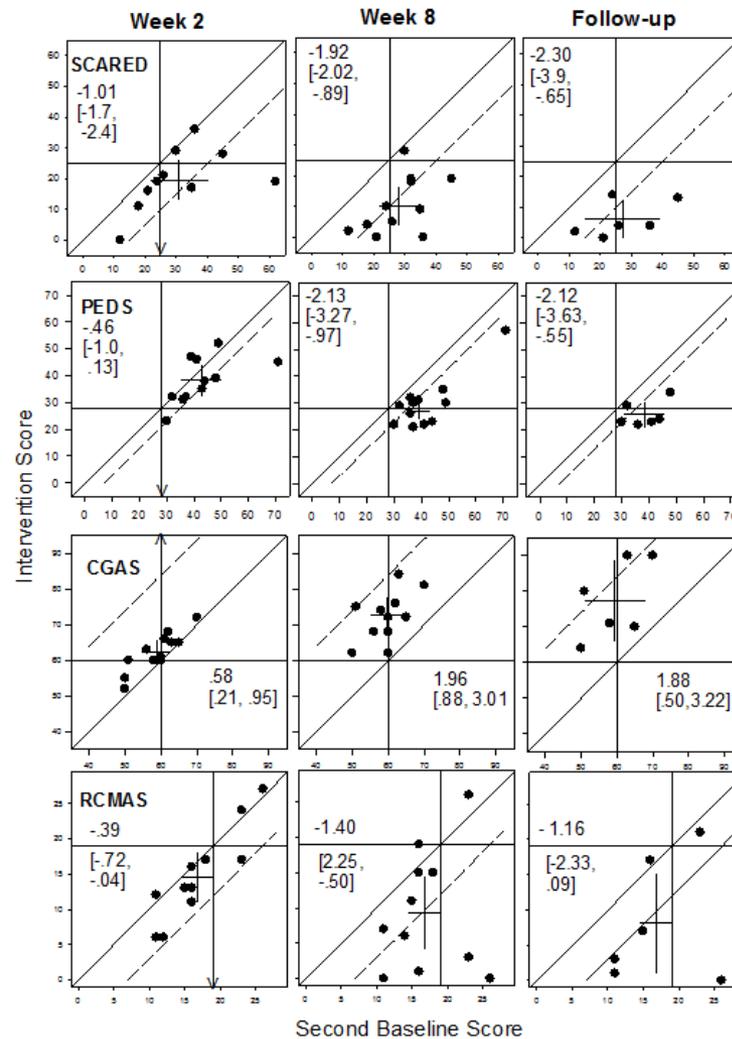
Understanding Modified Brinley plots



Results: Stability in baseline



Results: Treatment



Limitations

- Open label trial, no blinding to conditions
- No placebo
 - BUT: ES reported are larger than typical of placebo response
(Grissom, 1996)
- Side-effects/swallowing difficulties for some children led to reduced dose and some non-compliance with full protocol

Conclusions

- Children's anxiety was in clinical range at outset
- Majority met DSM criteria for anxiety diagnosis
- Measured anxiety was generally stable over baseline up to 3 weeks
- Slight trend to reduction on some measures – so conservative approach to data analysis
- Large ES evident by week 8 for parent & clinician measures
- Large ES by week 8 for self-report measures, but much more variable response
- Gains largely maintained @ follow-up [but with loss of ~50% of participants]
- Research needs replication, with placebo control

ACKNOWLEDGEMENTS

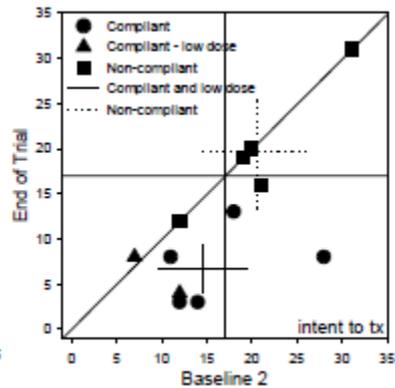
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Effect of non-compliance

SDQ Total Difficulties Score



CGAS

