Cereal fibre and psychological wellbeing in young and middle-aged adults

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Conflict of interest regarding this presentation:

I wish to declare a potential conflict of interest, and that I have received either direct or indirect industry support in relation to all or part of the results presented here.
Background

- Higher fibre intake associated with multiple health benefits
- Many people do not meet the current recommendations for fibre intake (30g/day, Hauner et al., 2012; SACN, 2015)
- Short-term gastrointestinal symptoms could act as a barrier to compliance

Emerging evidence of psychological benefits:

- Higher fibre intake associated with increased wellbeing (Smith, 2010)
- Intake of high fibre cereals associated with better physical and psychological health (Smith, 2005; 2011)
- Improved physical and psychological wellbeing after 2-week interventions with high wheat bran fibre breakfast cereals (Lawton et al., 2013) or breakfast cereals and snacks (Lawton et al., 2011)

Fibre and Digestive Health: Benefits for wellbeing?

The Effect of Fibre Intake on Health

Poor intake

- Slow transit + Low stool weight
- Irregularity
- Constipation
- Intestinal ill health
- Digestive discomfort symptoms

High intake

- Physiological wellbeing
- Psychological wellbeing
- Optimal stool weight and transit time
- Digestive health

Fibre Intake

Overview – sources of data

**Study 1***: Short term (14-day) cereal fibre intervention study

- Male and female participants (n=153, aged 25-50yrs)
- Breakfast cereals

**Study 2**: Short term (14-day) cereal fibre intervention study

- Female participants (n=23, aged 18-22yrs)
- Breakfast cereals and snacks

**Study 3**: 12-week randomised controlled dietary intervention study: Healthy eating diet (HE) vs. HE plus advice and products to increase fibre intake (HE+F)

- Female participants (n=71, aged 18-48yrs)
- Breakfast cereals and snacks

Study 1: 2-week Cereal Fibre Intervention
Breakfast cereals

- 153 Healthy adults
- 25-50 years
- BMI 18.5-30 kg/m²
- Low fibre consumers (<15g/day)

- Choice of 7 cereals all high in wheat bran fibre

204 volunteers screened

48 volunteers ineligible to participate

156 eligible participants

Baseline Period (2 weeks):
Habitual diet
n=156 participants

Intervention Period (2 weeks):
Wheat bran fibre intervention
n=153 participants

n=153 for ITT analysis

Usual diet

Consume at least one serving of study breakfast cereal/day
(2*100ml scoop)
Study 1: Increasing Fibre Intake Improved Digestive Discomfort

Mean (SD) Fibre Intake from Study Breakfast Cereals:

Total Fibre = 13.9 (4.7) g/day (range: 7.8–31.6 g/day)
Wheat Bran Fibre 9.8 (3.3) g/day (range: 5.4–22.1 g/day)

Daily ratings of digestive discomfort over the 14 days:

Likert Scale
0 = none
1 = minimal
2 = moderate
3 = a lot/very
4 = extreme

Lawton, CL et al., (2013). Nutrients. 5(4), 1435-1455
Study 2: Increasing Fibre Intake Improved all Measures of General Wellbeing

Likert Scale
0 = none
1 = minimal
2 = moderate
3 = a lot/very
4 = extreme

All differences p<0.0001

Lawton, CL et al., (2013). Nutrients. 5(4), 1435-1455
Study 2: 2-week Cereal Fibre Intervention
Breakfast cereals and snacks

- 23 Healthy females
- 18-22 years
- BMI 18.5-26.5 kg/m²
- Low fibre consumers (<15g/day)

Study Foods: A selection of 10 high wheat bran fibre snacks and 3 high wheat bran fibre breakfast cereals in blind packaging. Replaced 2 usual snacks and/or breakfast cereals with study foods each day

Questionnaires:
- DINE Questionnaire to assess average daily fibre consumption
- Online Daily Wellbeing Questionnaire to assess daily bowel activity (Bristol Stool Form Scale), mood, body image, alertness and hunger ratings

Increasing Cereal Fibre Intake Improved Psychological Wellbeing

Increasing Cereal Fibre Intake Improved Psychological Wellbeing

Study 3: 12 week RCT
Healthy Eating (HE) vs. HE plus Fibre (HE+F)

• Healthy females
• 18-48 years
• BMI 26-35 kg/m²
• Low fibre consumers (<15g/day)

Initial Contact
N=752

Screening Phase
N = 237

Inclusion /Baseline Phase
(up to 4 weeks)
N=168

Intervention Phase (12 weeks)
N=80

HE Diet
N=40

HE+F Diet
N=40

Products
Recipes
Advice

De-Briefing Visit
N=71 completers

N=36 completers

N=35 completers
**Change in Fibre Intake over 12 weeks**

**DINE: Fibre score**

- **Inclusion**
  - HE: 14.1 (0.52)
  - HE+F: 14.5 (0.59)

- **Week 12**
  - HE: 17.7 (0.76)
  - HE+F: 25.2 (1.45)

**HE+F (N=35): Fibre points recorded in daily diaries**

[Graph showing daily fibre intake over 12 weeks]
Summary of Effects of HE and HE+F Diets on Wellbeing Symptoms

Difference in Diets for:

Feeling Fat (p<0.001) *less on HE+F*
Bowel Pain (p<0.001) *less on HE+F*
Indigestion (p<0.05) *less on HE+F*
Feeling Slim (p<0.001) *more on HE+F (weeks 5-12)*

Frequency of scores of ‘Feeling Fat’: HE & HE+F

Likert Scale
0 = none
1 = minimal
2 = moderate
3 = a lot/very
4 = extreme
Summary of cereal fibre effects

Study 1 and 2:

- Significant improvements in subjective perception of general wellbeing during the intervention relative to baseline:

  * Feeling less fat, stress, mental and physical tiredness and difficulty concentrating; feeling more slim (both studies)*

  * Feeling more mentally alert, happy and energetic (Study 1)*

- Benefits increased with increasing cereal fibre consumption

Study 3:

- Both HE and HE+F diets promoted significant improvements subjective wellbeing

- The HE+F diet conferred larger reductions in feeling fat, bowel pain and indigestion

- Complying with the HE+F diet for >1 month had a greater impact on feeling slim
Conclusions

- Encouraging consumption of foods high in cereal fibre offers an acceptable strategy to increase dietary fibre intake in both young and middle-aged adults.
- Increasing cereal fibre intake can produce improvements in both physical and psychological wellbeing in a relatively short period (2-weeks).
- The majority of the population are deficient in fibre intake but positive messages around improved psychological wellbeing could help increase consumption.
Thank You!

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