Comparison of computerised dietary assessments with diet history and food record data at baseline in a food-based clinical trial

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Background

- Food-based clinical trials →vital to advance the scientific evidence
  - impact of food on health.
- Require stringent dietary assessment to substantiate effects
  - under-reporting common
- Automated assessments growing in use

DietAdvice website

- Developed 2003-2005
  - 1995 Food composition data
  - Focused on macronutrient composition
- Updated 2007-2009
  - 2006 Food composition data
  - Micronutrient data included
  - New user interface

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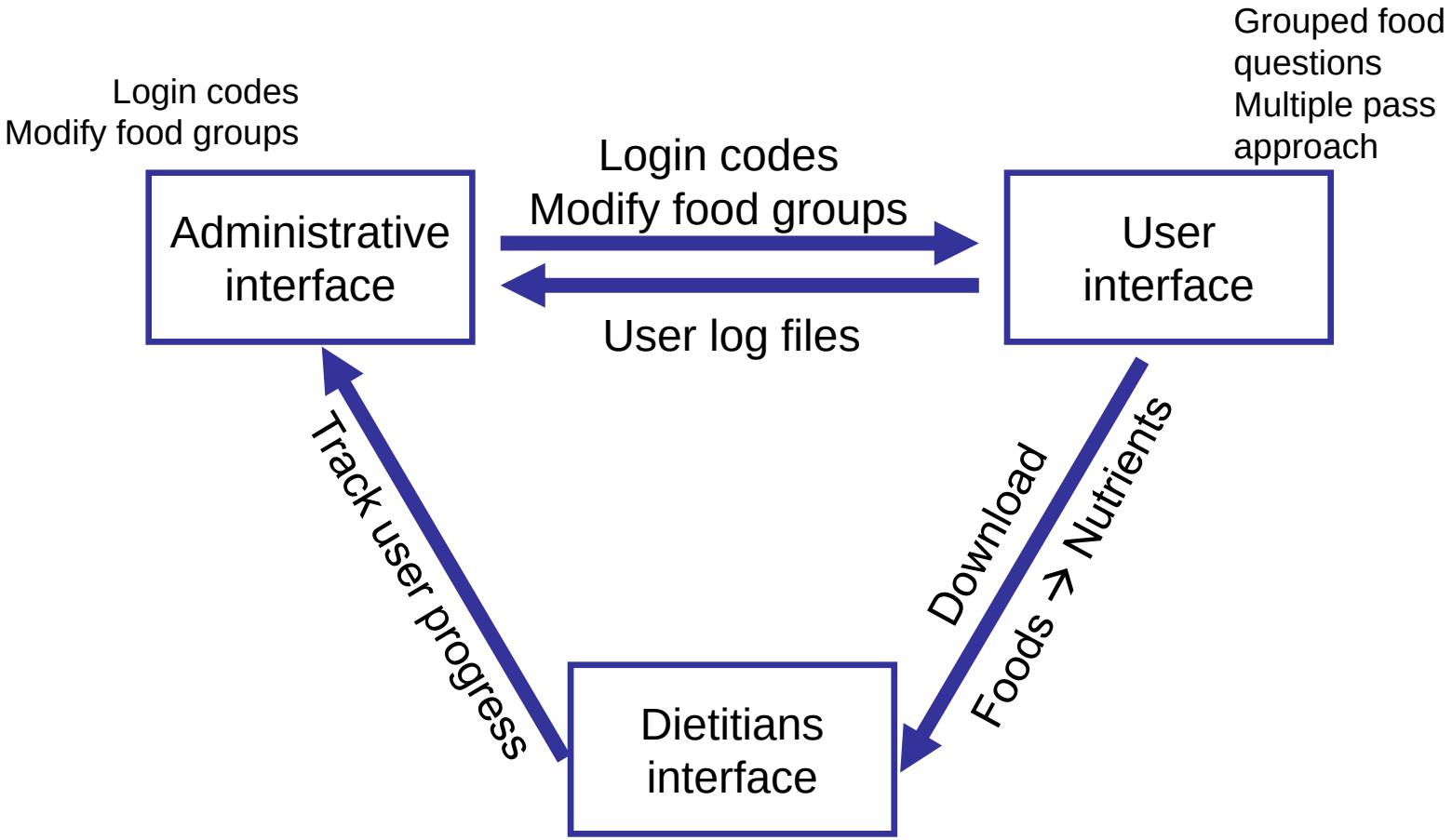
Structure of DietAdvice



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Objective

- To compare data from DietAdvice with diet history (DH) and food record (FR) dietary assessments measured at baseline

Clinical trial

- 12 month weight loss trial
  - Focus: long chain polyunsaturated fatty acid intakes
- Pre-study assessment
  - weight, height and percent body fat measured, diet history (DH) interview with a dietitian
- 3-day food record (FR)
  - t=0, 1, 2, 3, 6, 9, 12mo.
- DietAdvice (DA) while in calorimeter facility
  - t=0, 3, 12mo.

Baseline cross sectional study

- Baseline data for n=71 overweight participants (23-60 years, BMI 25-37 kg/m2)
- Dietary assessments → FoodWorks 2007
- Macronutrient data for matched dietary assessments
  - n=32 matched DA-DH assessments
  - n=30 matched DA-FR data sets

Statistical analyses

- Paired t-tests (all nutrients)
- Pearson's correlations (all nutrients)
  - relationships btw assessments
- Goldberg cut-off limits (energy)
  - levels of underreporting
  - 95% confidence limit, 1.14 for DH, 1.10 for FR and 1.06 for DA
  - Cut-off limits are dependent on the size of the cohort and the duration of the trial

Participant characteristics

	Males (n=15)	Females (n=56)	All (n=71)
Age (years)	45.7 ± 9.9	45.3 ± 7.4	45.4 ± 7.9
Weight (kg)	92.2 ± 7.4	88.5 ± 11.7	89.3 ± 11.0
Height (cm)	175.0 ± 6.2	166.2 ± 5.2	168.0 ± 6.5
BMI (kg/m^2)	30.2 ± 2.8	32.0 ± 3.6	31.6 ± 3.5

Relationships btw assessments

- DietAdvice provided significantly higher reported energy intake (kJ) compared to both the DH and the FR ($P < 0.01$)
  - CHO (% E) intake significantly higher in DA compared to DH
  - SFA (% E) and MUFA (% E) intakes significantly higher in DH compared to DA
  - SFA (%E) intake significantly higher in FR compared to DA
- Relatively high correlations (r^2=0.740 and 0.596, respectively) between assessments

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DH vs. DA (n=32)

Variable	Diet History	Diet Advice	Correlation
Energy kJ	9368.3 ± 3445.5*	15437.5 ± 12616.5	.740
%E PRO	17.9 ± 4.1	19.1 ± 4.5	.358
%E FAT	35.0 ± 6.7	32.3 ± 6.3	.124
%E SFA	12.9 ± 3.8**	11.3 ± 3.6	.433
%E PUFA	5.4 ± 1.4	6.0 ± 2.8	.190
%E MUFA	13.6 ± 3.6**	12.0 ± 2.8	.123
%E CHO	42.7 ± 6.9*	46.5 ± 6.7	.351

* Sig. (2-tailed) P<0.01
** Sig. (2-tailed) P<0.05

FR vs. DA n=30

Variable	Food Record	Diet Advice	Correlation
Energy kJ	9397.2 ± 3632.6*	15739.7 ± 12981.4	.596
%E PRO	17.7 ± 4.1	19.1 ± 4.6	.345
%E FAT	34.0 ± 6.8	32.1 ± 6.3	.357
%E SFA	13.4 ± 4.2*	10.9 ± 3.2	.485
%E PUFA	5.4 ± 1.8	6.2 ± 2.8	.454
%E MUFA	12.2 ± 2.7	12.1 ± 2.9	.250
%E CHO	44.3 ± 7.4	46.6 ± 6.8	.273

* Sig. (2-tailed) P<0.01

Under-reporting

- Under-reporting energy
  - DH 35% (n=25/71)
  - FR 19% (n=13/69)
  - DA 16% (n=5/32)
- Men underreported (40% DH and 21% FR) more than women (34% DH and 18% FR)
- No men underreported in DA while 19% women underreported

Conclusions

- DietAdvice and the FR are more comparable than the DH
  - Replacement of the traditional FR is not yet warranted
  - Further evaluations of DietAdvice in a clinical trial
- Biomarker validation
  - DietAdvice consistently provided larger reported intakes compared to the DH and FR
  - Traditional dietary assessment methods → high levels of underreporting of energy intake

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