



**Title: Clinical Diet Counselling for Metabolic Syndrome in Canadian Primary Care**

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**Background**

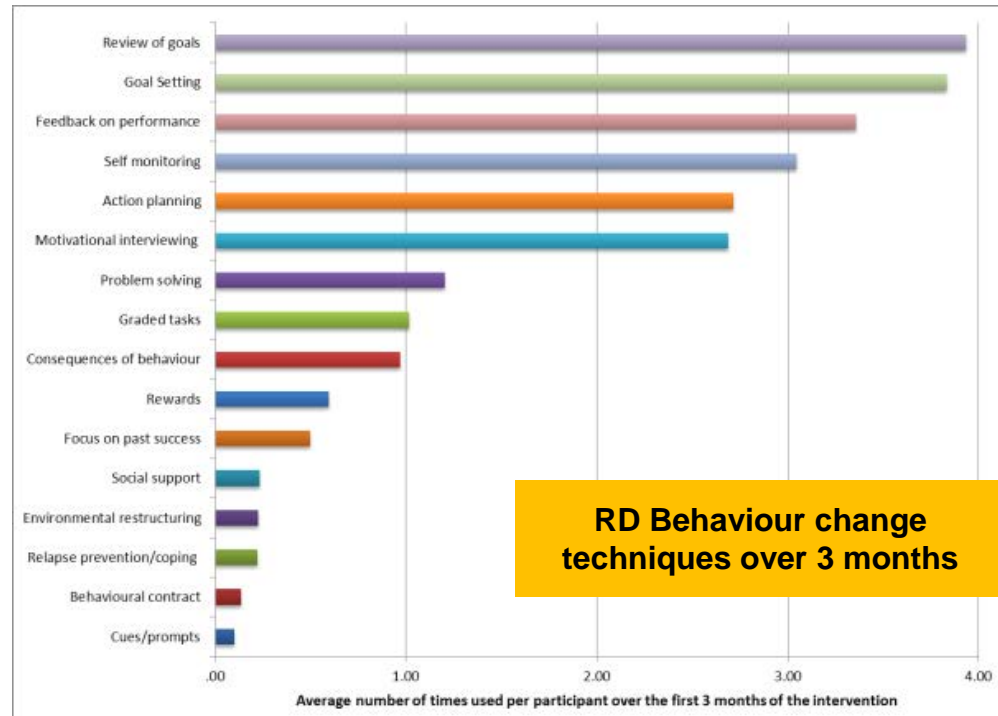
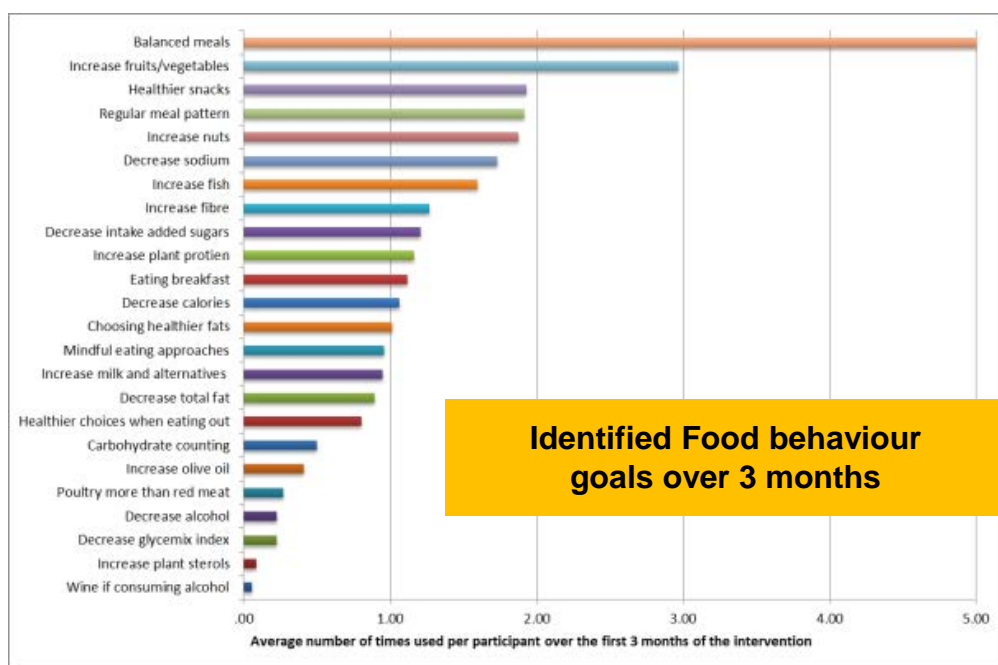
About 20% of Canadian adults meet the criteria for metabolic syndrome (MetS) [1]. Canadian Health Advanced by Nutrition and Graded Exercise (CHANGE) was a one-year lifestyle intervention in primary care designed to assess the extent to which MetS could be reversed with intensive one-on-one counselling for 12 weeks by dietitians and kinesiologists, followed by monthly follow-up by the team (including family physician) to one year. Mediterranean type diets were a focus due to results of the PREDIMED study [2].

**Objectives**

This sub-study in 242 patients who completed baseline and 3 month diet review sought to describe: 1) Dietitian self-reported use of selected behavioural techniques and food behaviour goals, 2) patient self-reported food behaviours at baseline and after 3 months, and 3) degree of agreement.

**Overall Results** [mean ± SD or %]

- Age: 59.7 ± 9 years • Body weight: 91 ± 15 kg • 50% female
- Met International Diabetes Federation (IDF) criteria [%]: 94% Waist Circumference, 87% blood pressure, 82% blood glucose, 64% triglycerides, 47% HDL-C
- Baseline HEI score: 58 ± 14 of 100 maximum
- Baseline MDS score: 4.7 ± 1.6 of 14 maximum



**References**

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2. Estruch R, et al. N Engl J Med. 2013;368(14):1279-90.
3. Michie S, et al. Psychol Health 2011;26:1479-1498.
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**Methods**

- 14 Registered Dietitians (RDs) from 3 clinics (Alberta, Ontario and Quebec) reported on counselling process. RDs reported on their:
  - ✓ Top 4 behaviour change strategies, based on the CALO-RE taxonomy of Michie and colleagues (2011)[3].
  - ✓ Identified food behaviour goals from list of 24 possible goals [4].
- RDs assessed diet at baseline and 12 weeks, using two 24hr multi-pass recalls, as well as two diet quality scores adapted to serving sizes in *Eating Well with Canada's Food Guide*:
  - ✓ Canadian Healthy Eating index (C-HEI) (Range 0 to 100) [5].
  - ✓ Mediterranean Diet Score (MDS) (Range 0 to 14) [2].

**Patient Diet - HEI components at baseline and 3 months**

HEI Component	Range of scores	Baseline Mean Score	Mean Change in Score	Mean change equivalents <sup>1,2</sup>
<b>Adequacy (Higher scores indicate higher intake)</b>				
Total vegetables and fruits	0-10	6.3	+1.4 (2.8)***	~ 1 serving
Whole fruit	0-5	3.6	+0.6 (1.9)***	<0.2 servings
Dark green and orange vegetables	0-5	2.7	+0.9 (2.3)***	~0.25 serving
Total grains	0-5	3.3	-0.3 (1.5)**	~0.36-0.42 serving
Whole grains	0-5	2.5	+0.8 (2.2)***	~0.5-0.6 serving
Milk and alternatives	0-10	4.7	+0.8 (3.5)***	~0.25 serving
Meat and alternative	0-10	8.0	+0.4 (2.7)*	<0.1 serving
Unsaturated fats	0-10	3.5	-0.2 (3.7)	~0
<b>Moderation (Higher scores indicate lower intake)</b>				
Saturated fats	0-10	5.9	+1.3 (3.9)***	Decrease in % of energy from SFA by ~1% (11.3%→10.4%)
Sodium	0-10	6.6	+1.2 (3.2)***	Decreased intake of sodium by ~360 mg (2690mg →2360mg)
Other foods	0-20	10.7	+3.9 (7.2)***	Decrease in % of energy from other foods by ~7% (21.23%→14.23%)
<b>Total</b>	100	57.8	<b>+11.0 (15.2)***</b>	

Statistically significant changes over time: \*p<0.05, \*\*p<0.01, \*\*\*p<0.001.  
<sup>1</sup> Mean equivalent changes in food servings based on scoring codes for adults >51 years as 82% of participants were >51 years at baseline.  
<sup>2</sup> Ranges have been indicated where recommendations differ between genders

**Patient Diet - MDS components at baseline and 3 months**

MDS Component	Scoring= 0, 1 Criteria for "1"	Percentage of participants achieving score of "1"	
		Baseline (n=197)	3 months (n=221)
Fruits	≥ 3 servings/ day	28.2	37.6
Vegetables	≥ 4 servings/day; ≥ 2 raw	15.2	36.7 <sup>a</sup>
Red or Processed Meats	< 2 servings/day	68.5	84.6 <sup>a</sup>
Legumes	≥ 3 servings/week	8.1	12.7
Fish or seafood	≥ 4 servings/week	13.2	19.0
Nuts	≥ 3 servings/week	34.5	54.8 <sup>a</sup>
Poultry more often than red meat	Yes	51.8	73.3 <sup>a</sup>
Butter or Cream	< 1 tbsp/day	71.6	77.4 <sup>a</sup>
Olive oil as main fat	Yes	34.5	38.9 <sup>a</sup>
Olive oil	≥ 4 tbsp/day	6.6	12.7 <sup>a</sup>
Wine	≥ 7 servings/week	7.1	6.3
Commercial baked goods	≤ 2 times/week	47.2	72.4 <sup>a</sup>
Sugar sweetened beverages	< 1/day	89.3	94.1 <sup>a</sup>
Sofrito sauce	≥ 2 times/week	0	0.9

<sup>a</sup> McNemar tests for change over time were significant (p<.05).

**Interpretation**

1. Balanced meals was a prominent food goal, but not assessed by HEI or MDS.
2. Advice to increase fruits and vegetables was reflected in HEI and MDS scores.
3. Participants increased intake of nuts and poultry and decreased processed meats and other foods. Use of fish, legumes and wine changed little.
4. Prominent behaviour change techniques focused on goals and self-monitoring.