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A Culturally Sensitive Anti-hypertensive Dietary Education Intervention for Chinese Canadians in the Community: The DASHNa-CC Study

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Committee Members

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Bertha Rosenstadt
Doctoral Research
Dissertation Grant

Background

- Numbering 1.3 million, the Chinese compose approximately 4% of Canada's population and 21% of the country's visible minorities (Statistics Canada, 2011)
- Hypertension prevalence rate of Chinese Canadians is 15.1% (Chiu et al., 2010)
- Hypertension accounts for a large proportion of stroke, myocardial infarction and heart failure in the Chinese population (Yong et al., 2013)
- Unhealthy dietary behavior is the most important modifiable risk factor for hypertension in Chinese population (Wang & Li, 2012)

Antihypertensive Dietary Interventions

Canadian Hypertension Education Program guidelines recommend

- Dietary Approach to Stop Hypertension (DASH)
- Sodium Reduction (Dasgupta et al., 2014)

	DASH		DASH-Na	
	Lower SBP ^a	Lower DBP ^b	Lower SBP ^c	Lower DBP ^d
All participants	5.5	3	8.9	4.5
Hypertensive participants	11.4	5.5	11.5	
Non-hypertensive participants	3.5	2.1	7.1	

a, b: DASH diet compared with the control diet (Appel et al., 1997)

c, d: DASH diet with a low sodium level compared with the control diet with a high sodium level (Sacks et al., 2001)

Knowledge gaps of DASH evidence

- Feeding study, not sure about its effectiveness in free living community population
- No DASH clinical evidence has been investigated in Canada
- Not culturally sensitive to ethnic group

Food therapy of Traditional Chinese Medicine (TCM)

Four principles of the TCM food therapy

- Light eating
- Balance of three food natures: cool and cold, neutral, warm and hot
- Harmony of five food tastes: sour, sweet, bitter, pungent and salty
- Diet consistent with different health conditions (Liu, 2007)

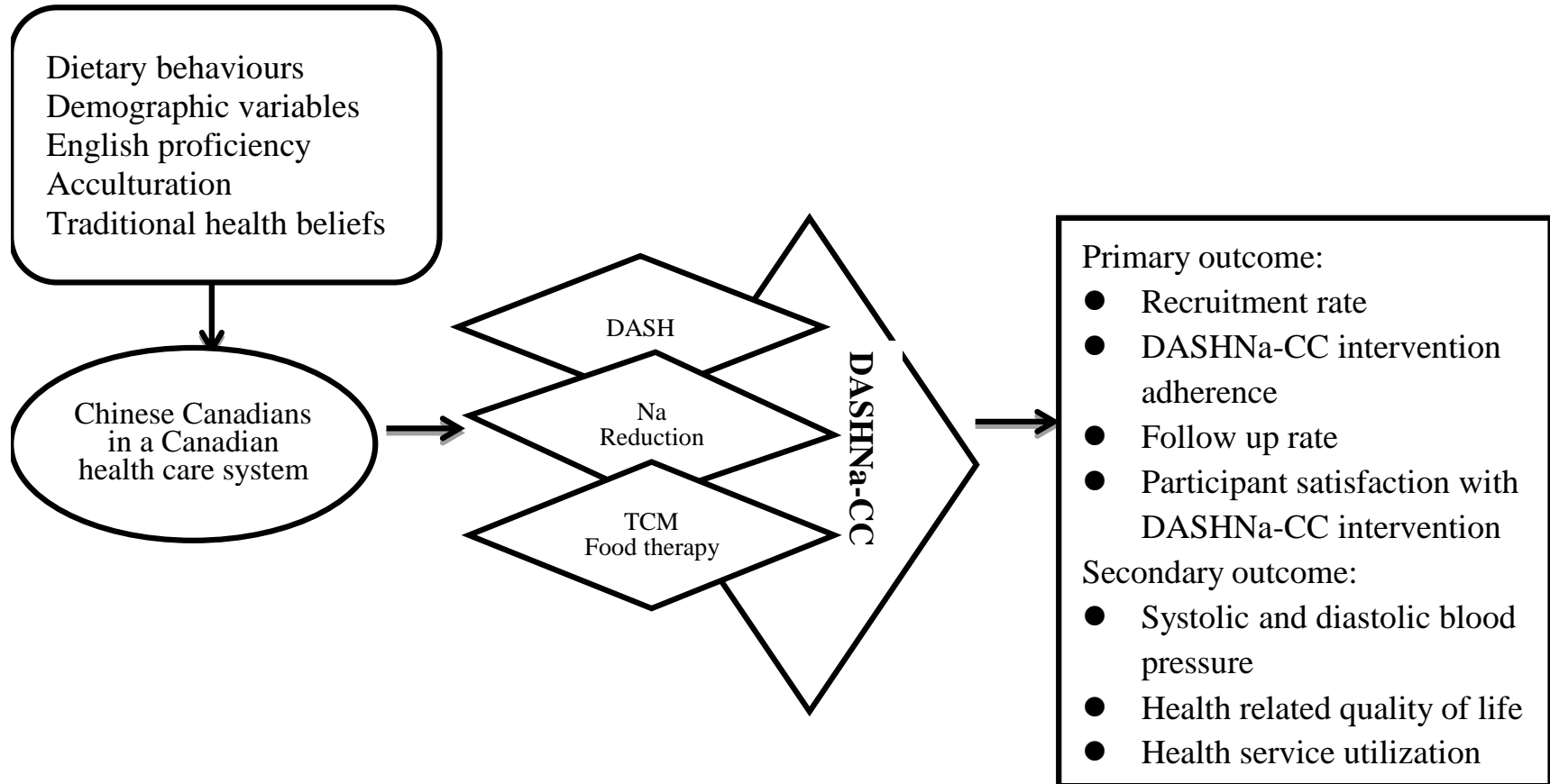
Evidence of the TCM food therapy

- TCM classic
- Expert opinions
- Clinical studies (Shen et al., 2009)

Review of Chinese Literature of the TCM food therapy

- 20 books included
- 38 most frequently recommended antihypertensive foods

DASHNa-CC Theoretical Model



Research Questions: Primary

Is it feasible and acceptable to deliver the DASHNa-CC intervention in Chinese Canadian communities?

- Recruitment rate
- Intervention adherence
- Follow-up rates
- Participants satisfaction with the intervention

Research Questions: Secondary

Compared with usual care, what is the effect of an eight week DASHNa-CC educational intervention on:

- Systolic and diastolic blood pressure
- Health related quality of life
- Health service utilization?

Research Design

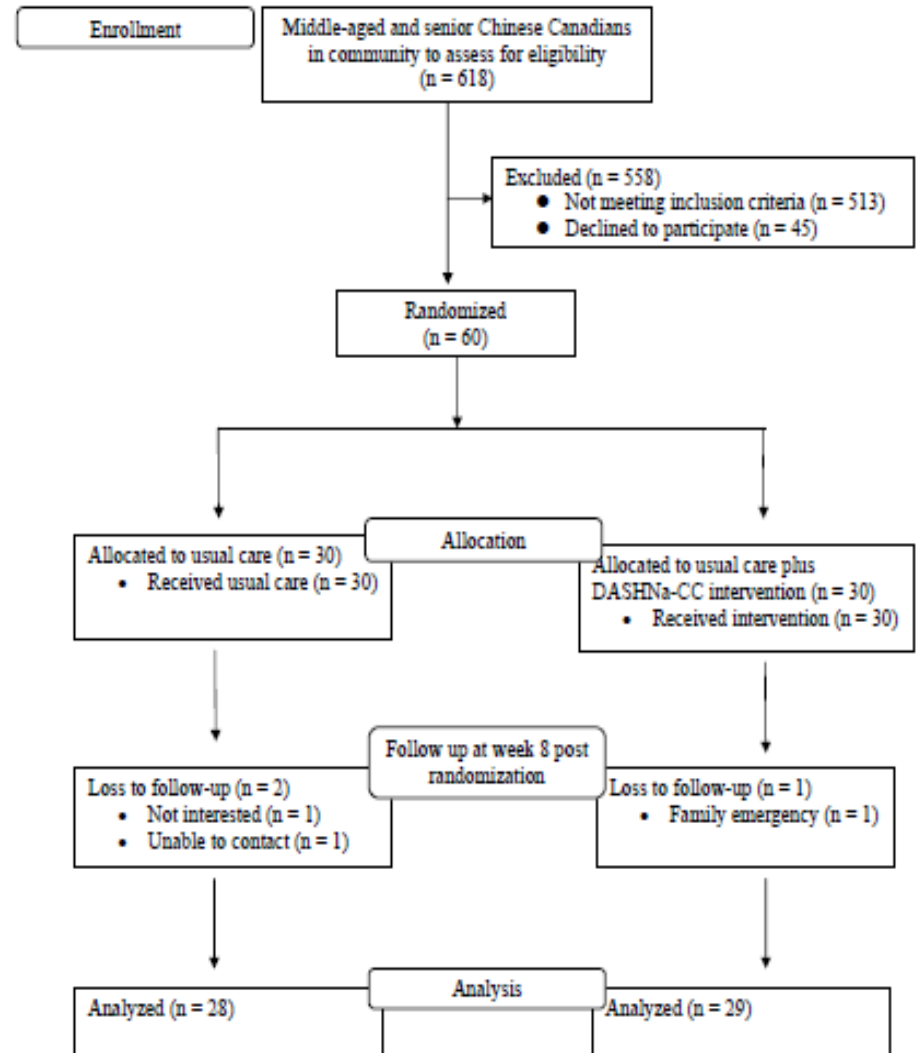
Randomized controlled trial

Sample size

- 60 (30 per group)

Study setting

- Centre for Immigrant and Community Services, Scarborough, Ontario



Control: Usual Care

- General hypertension health education
 - Hypertension education booklet from Heart and Stroke Foundation of Ontario, titled *Get Your Blood Pressure under Control (Chinese version)*
- Encouraged to see their family physician / primary health care provider
- Access to family physician, tele-health, emergency care, hospital and other health care facilities in the Greater Toronto Area as required



控制血压
安康之道





Intervention: DASHNa-CC

Food Group	Number of Serving				Serving size	TCM Recommended foods for blood pressure control
	1600 cal/d	2000 cal/d	2600 cal/d	3100 cal/d		
Grains and grain products	6	6-8	10-11	12-13	1/2 c cooked rice, pasta, noodle 1 slice bread	Buckwheat, corn, oat
Vegetables	3-4	4-5	5-6	6	1/2 c cooked vegetables 1 c raw leafy vegetables 6 oz vegetable juice	Celery, garlic, onion, eggplant, carrots, tomatoes, mushrooms, spinach, black fungus, green onion, potato, winter melon, bitter melon
Fruits	4	4-5	5-6	6	1 medium fruit 6 oz fruit juice 1/4 c dried fruit 1/2 c fresh, frozen, or canned fruit	Banana, hawthorn, apple, persimmon, kiwi, watermelon, pear
Low-fat or fat-free dairy foods	2-3	2-3	3	3-4	8 oz milk 1 c yogurt 1.5 oz cheese	Fat-free/low-fat milk and other dairy products, e.g. yogurt, cheese
Meats, poultry and fish	1-2	≤2	2	2-3	75g (2.5 oz) cooked meats, poultry or fish 2 egg	Seaweed, laver, jellyfish
Nuts, seeds, dry beans and peas	3/wk	4-5 /wk	1	1	1/2 c nuts 1/2 cooked dry beans and peas 2 tbsp peanut butter	Green bean, peanut, pea, soybean, soy products, e.g. tofu, soy milk, bean-curd sticks
Fats and oils	2	2-3	3	4	1 tsp vegetable oil	
Sweets and others	0	≤5/wk	≤2	≤2	1 tbsp sugar 1 tbsp jelly or jam 8 oz sugared lemonade	Honey, vinegar
Herbal teas	Semen Cassia 15 g per day; Fructus Lycii 10 g per day; Flos Chrysanthemi 10 g per day; Broadleaf Holly Leaf 5 g per day; Green tea 5 g per day.					
Sodium	1500 mg per day for adults aged less than 51 years; 1300 mg per day for age 51 to 70 years; 1200 mg per day for age more than 70 years.					

Daily servings, except as noted otherwise



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Fruits	4	4-5	5-6	6	1 medium fruit 6 oz fruit juice 1/4 c dried fruit 1/2 c fresh, frozen, or canned fruit	
Low-fat or fat-free dairy foods	2-3	2-3	3	3-4	8 oz milk 1 c yogurt 1.5 oz cheese	
Meats, poultry and fish	1-2	≤2	2	2-3	75g (2.5 oz) cooked meats, poultry or fish 2 egg	
Nuts, seeds, dry beans and peas	3/wk	4-5 /wk	1	1	1/2 c nuts 1/2 cooked dry beans and peas 2 tbsp peanut butter	
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Meats, poultry and fish	1-2	≤2	2	2-3	75g (2.5 oz) cooked meats, poultry or fish 2 egg	Seaweed, laver, jellyfish
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Intervention: DASHNa-CC



- **DASHNa-CC Intervention Manual**
 - 4 chapters, 31 pages and 14,604 Chinese words
 - 1 separate page to be posted on a refrigerator
- **Classroom sessions in a community centre**
 - 2 sessions, 2 hours per session
 - On week 1 and 2 post randomization
 - RN-led classroom instruction and small group discussion in Mandarin
- **Booster telephone call**
 - 20 minutes
 - On week 5 post randomization
 - Provide further support after classroom education

Results: Demographic Characteristics

Mean age 62 years (SD = 11.2)

Majority of the participants

- were Han ethnics (n = 59, 98.3%)
- had southern Chinese lifestyle (n = 38, 63.3%)
- held bachelor degrees (n = 26, 43.3%)
- were married (n = 50, 83.3%)
- were retired (n = 37, 61.7%)
- had an annual family income less than \$20,000 (n = 30, 50%)
- had a known family history of hypertension (n = 36, 60%)
- had central obesity (n = 54, 90%)

Migration and acculturation characteristics

- mean number of years living in Canada was 9.2 (SD = 6.2)
- had low English proficiency
- accepted Chinese culture more than Western one
- had strong Chinese traditional health belief

Results: Primary Feasibility and Recruitment

Blood pressure screening

- 618 Chinese Canadians
- 28 community sites

Hypertension prevalence rate

- 54.5% (n = 337)

Eligibility rate

- 17% (n = 105)

Recruitment rate

- 57.1% (n = 60)

Strategies and settings	Number of sites	Screened	Eligible	Eligibility rate (%)	Recruited	Recruitment rate (%)	Screened recruited ratio (%)
Self-referral strategy:							
• Website advertisement and listserv email	--	63	31	49.2	31	100.0	49.2
Proactive recruitment strategies:							
• Church	4	62	8	12.9	2	25.0	3.2
• Community centre	3	44	2	4.5	1	50.0	2.3
• English class	2	41	3	7.3	2	66.7	4.9
• Library	3	26	10	38.5	3	30.0	11.5
• Physical activity class	2	26	1	3.8	1	100.0	3.8
• Restaurant	1	7	1	14.3	0	0.0	0.0
• Senior apartment	4	107	17	15.9	11	64.7	10.3
• Senior peer support group	8	155	24	15.5	9	37.5	5.8
• Shopping mall	1	87	8	9.2	0	0.0	0.0
Total	28	618	105	17.0	60	57.1	9.7

Intervention Adherence

- 96.7% (n = 29) participants attended the two classroom education sessions
 - 26.7% participants brought their families
- 100% participants received the week five telephone booster call
- At week eight post randomization, compared to the control group, the intervention group had a significantly higher mean in
 - The total DASH score [t (55) = 2.16, p = 0.04]
 - The total score of sodium reduction [t (55) = 3.84, p < 0.01]
 - The total score of TCM food therapy [t (55) = 5.32, p < 0.01]

Participation Satisfaction

- Participants perceived that
 - the information provided in the intervention was helpful
 - the delivery approach was suitable
 - they benefited from the intervention
 - the intervention did not cause burden to their lives
- 100% participants were highly satisfied with
 - this culturally tailored intervention
 - the integration of TCM into their blood pressure management
- lost to follow-up rate was 5%

Results: Secondary Blood Pressure

- Blood pressure reduction

	Control group		Intervention group	
	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Eight week post randomization	6.9	3.1	10.7	5.5

- Compared to the control group, the intervention group decreased
 - 3.8 mmHg [t (55) = -1.58, p = 0.12] more on systolic blood pressure
 - 2.4 mmHg [t (55) = -1.22, p = 0.23] more on diastolic blood pressure

Results: Secondary Health Related Quality of Life

- Mean change score: week eight post randomization minus baseline

	Control		Intervention	
	Mean	SD	Mean	SD
Physical component score	9.1	50.7	34.1	36.9
Mental component score	5.7	49.6	11.0	31.3

- Compared to the control group, the intervention group had a significant improvement in physical component score of SF-36 [t (55) = 2.13, p = 0.04]

Results: Secondary Health Service Utilization

- Participants primarily accessed their family physician for health services
- Family members were an important resource
- Participants used various Chinese media and rarely accessed English media
- The most frequently used Chinese media was the Internet followed by television and newspaper.
- There were no group differences

Conclusions

- It is feasible to conduct the DASHNa-CC study in Chinese Canadian community
- The DASHNa-CC intervention has potential to decrease blood pressure and improve health-related quality of life for Chinese Canadians and an adequately powered larger trial is needed to determine the effects of the DASHNa-CC intervention on blood pressure and health-related quality of life

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