

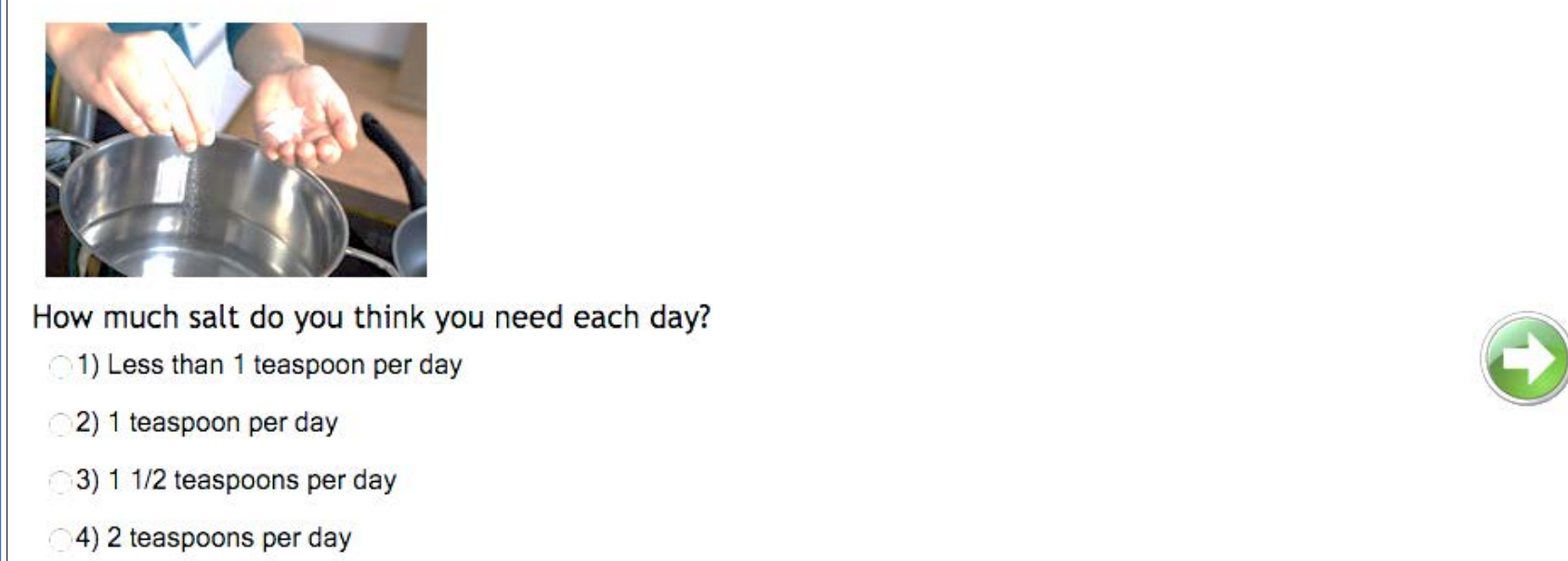
OBJECTIVE

- Examine long-term impacts of nutrition education on sodium intake in a low-income population

BACKGROUND

- Excess sodium intake is associated with increased blood pressure and heart disease
- Low-income populations at higher risk
- Women, Infants, and Children (WIC) program
 - 8.6 million mothers & children
 - Nutrition during pregnancy & early childhood
- WIC nutrition education
 - Integrated individual & group education
 - Emerging online tools

METHODS



- Intervention:** In-person and online education to reduce sodium intake and prepare foods using less salt
- Outcomes:** Knowledge and behaviors related to sodium reduction
- Participants:** 514 WIC participants randomly assigned to :
 - In-person group education (n=257)
 - Online education (n=257)
- Questionnaires :**
 - Baseline
 - 2-4-month follow-up
 - 9-month follow-up
- Multiple linear regression models to compare changes in outcomes from baseline to follow-up within and between education modalities

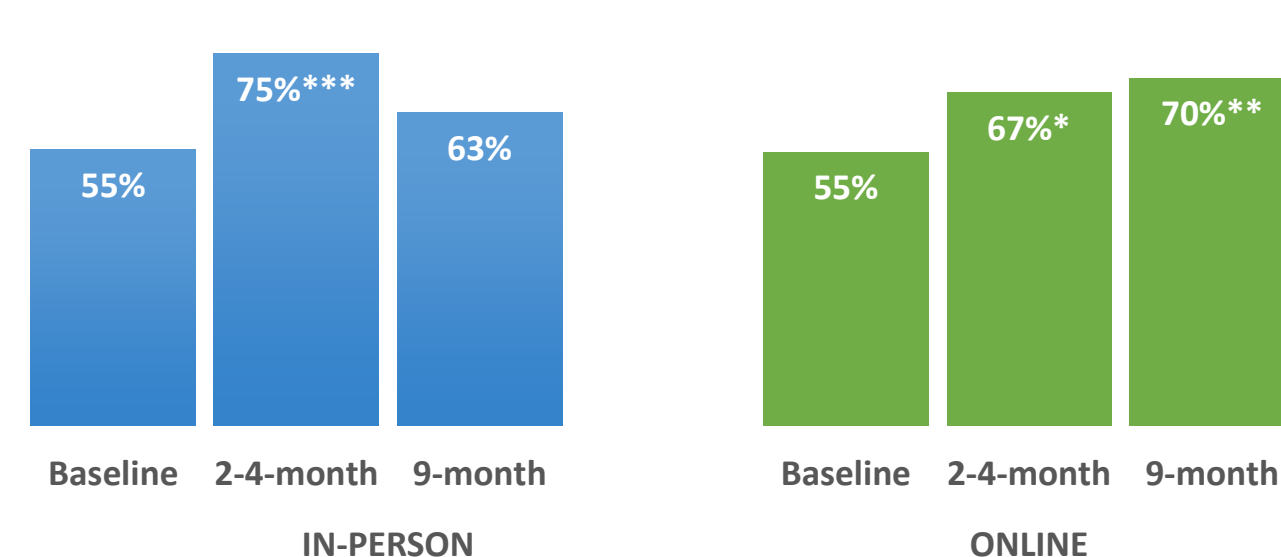
RESULTS

Knowledge

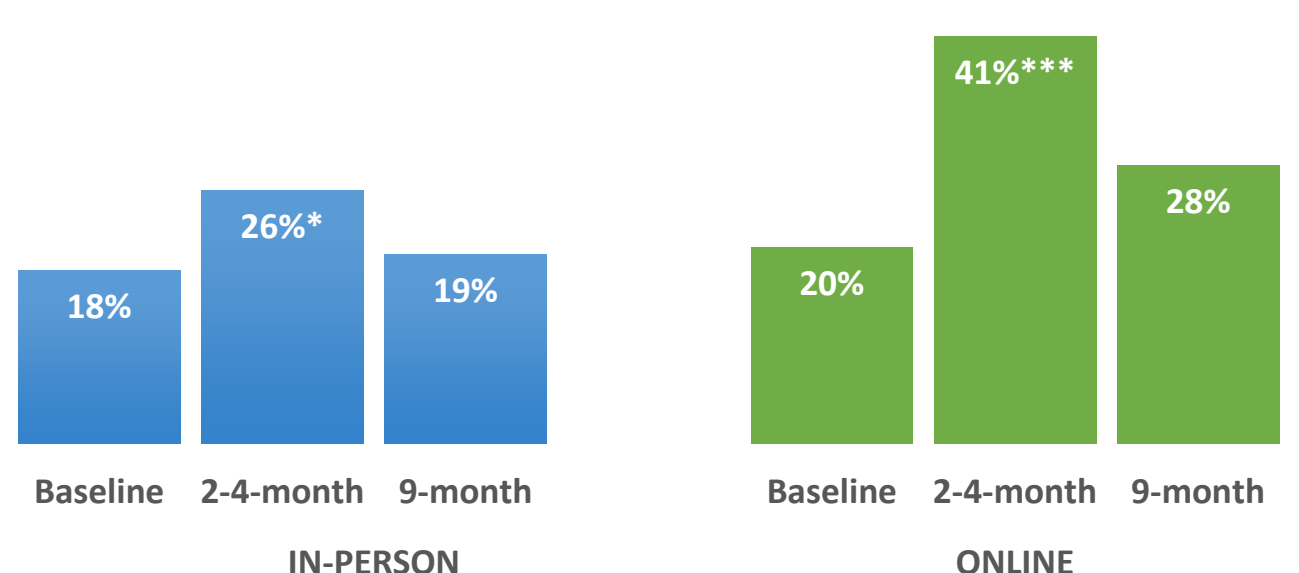
- Both groups increased knowledge about main source of salt and optimal amount of salt after 2-4 months
- The online group retained knowledge even after 9 months

Within group comparison

Main source of dietary salt is processed food (% correct)
Baseline vs 2-4-month, Baseline vs 9-month

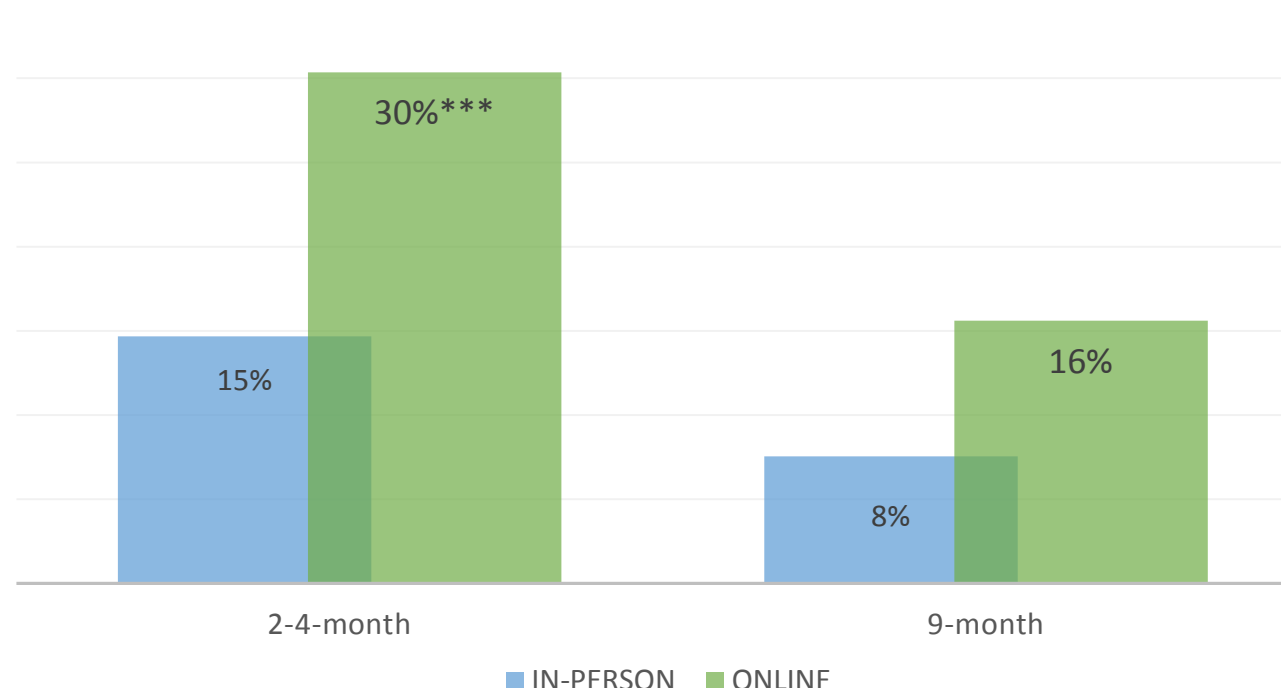


Adults should consume <2300 mg sodium daily (% correct)
Baseline vs 2-4-month, Baseline vs 9-month



Between group comparison

In-Person vs Online difference - Amount of sodium adults should consume daily (change in % correct)



RESULTS

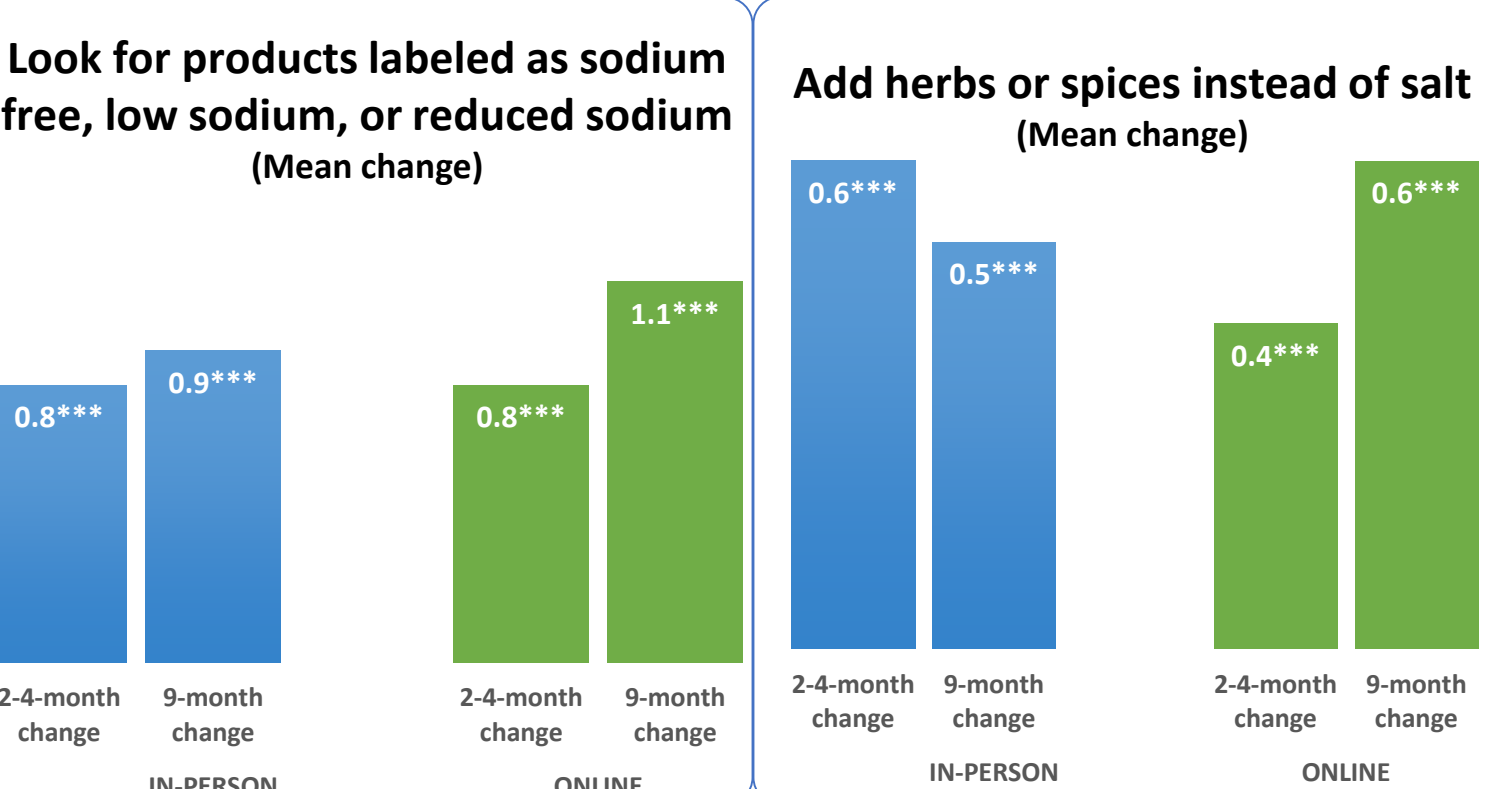
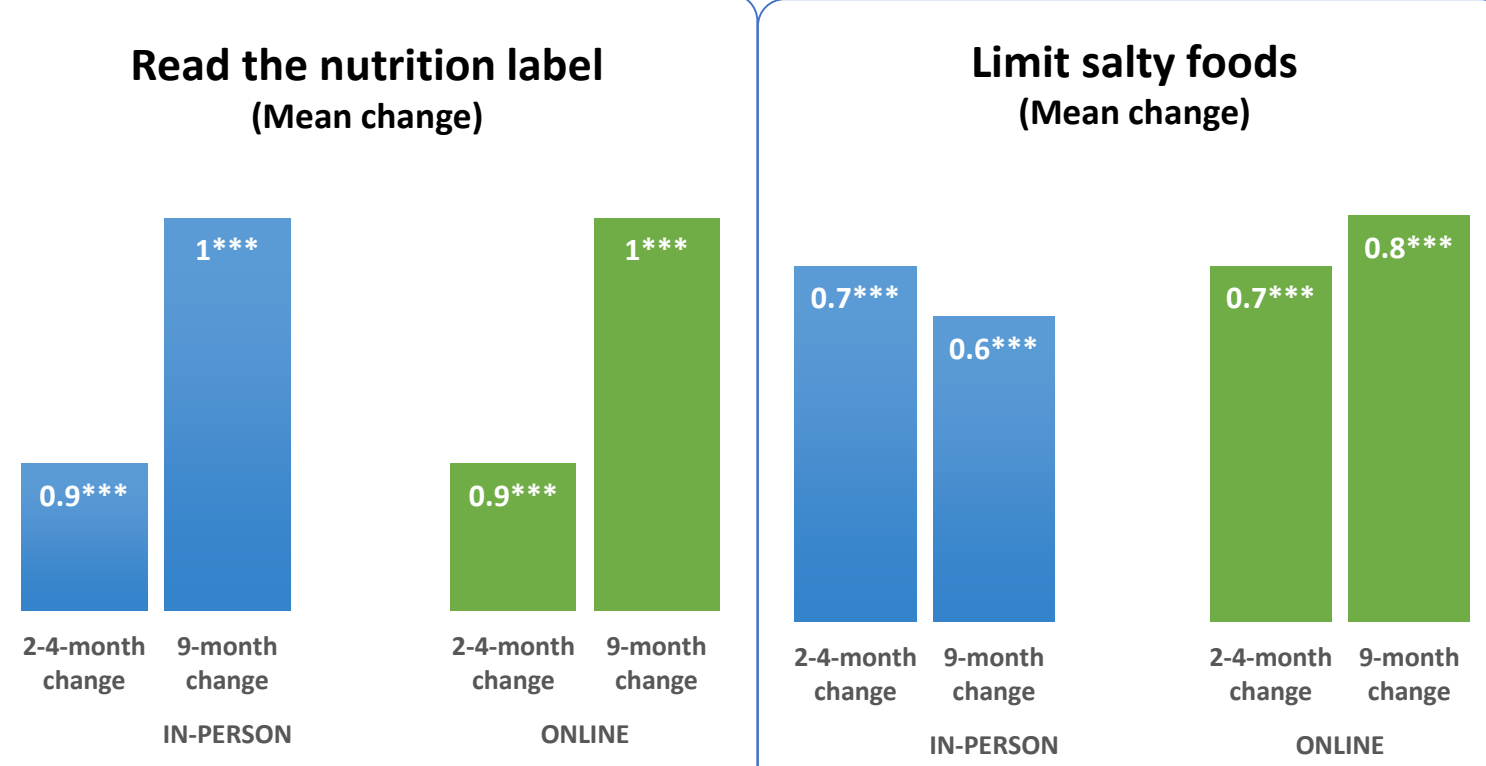
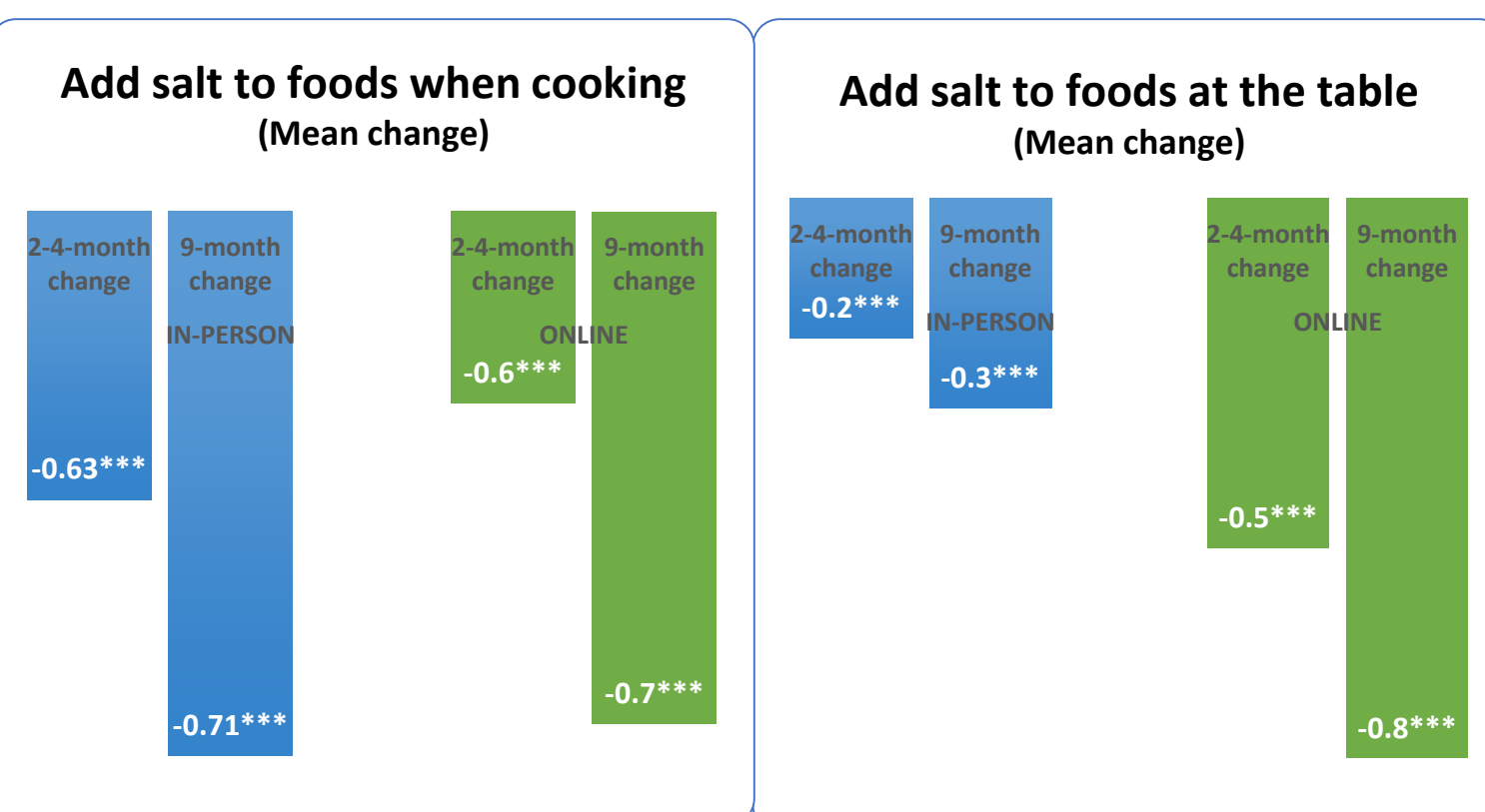
Behaviors

- All long-term dietary behaviors improved in both groups at 2-4 months and 9 months

Within group comparison

Long-term behaviors

Baseline vs 2-4-month change, Baseline vs 9-month change
1=almost never 2=once in a while 3=sometimes 4=often 5=almost always



RESULTS

Behaviors

Within group comparison

- Some short-term dietary behaviors improved in both groups

	Self-administered questionnaires			
	In-person		Online	
	2-4-month (n=152)	9-month (n=171)	2-4-month (n=136)	9-month (n=156)
Change ²	Change ²	Change ²	Change ²	Change ²
	(Mean days/week (SD))			

Eat at the following places				
Fast food	-0.2 (1.3)	-0.2* (1.2)	-0.3** (1.2)	-0.4*** (1.2)
Other restaurant	-0.3* (1.3)	-0.3** (1.4)	-0.2 (1.3)	-0.3* (1.1)
Eat the following foods				
Processed meats	-0.2 (1.7)	-0.3* (1.7)	-0.1 (1.4)	-0.3* (1.6)
Other packaged meals or sides	-0.2 (1.4)	-0.2* (1.3)	-0.1 (1.4)	-0.2 (1.2)
Canned or packaged soups	-0.2 (1.4)	-0.4** (1.4)	-0.2 (1.2)	-0.3** (1.1)
Cheese	-0.1 (1.9)	-0.2 (1.7)	0.6*** (1.6)	0.2 (1.4)
Ready to use or packaged condiments	-0.1 (1.7)	-0.1 (1.6)	-0.3* (1.4)	-0.3 (1.3)
Snack foods	-0.3* (1.4)	-0.2* (1.4)	0.0 (1.5)	-0.2* (1.4)
Average of the above foods	-0.1 (0.8)	-0.2* (0.8)	-0.0 (0.6)	-0.1* (0.7)
Any food with salt added at the table or during cooking	-0.7*** (2.4)	-0.6** (2.3)	-1.0*** (2.4)	-1.1*** (2.4)

Significant differences with yellow shading
Boldface indicates statistical significance at *P<0.05, **P<0.01, ***P<0.001

Between group comparison

- For some behaviors online or in-person education resulted in greater improvement

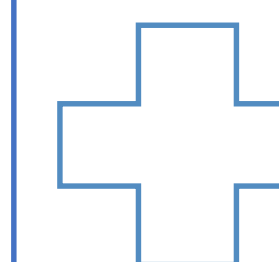
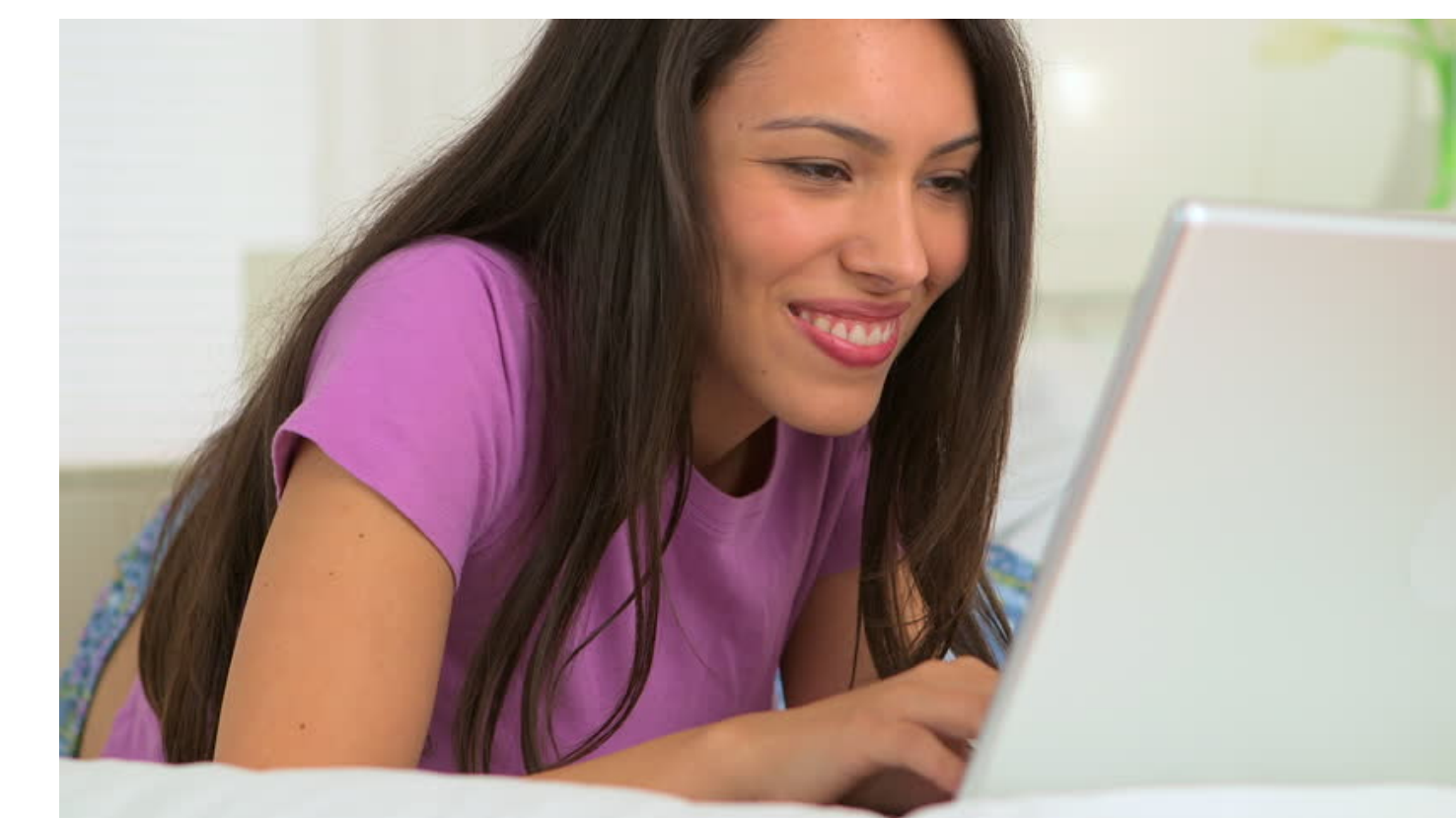
	All questionnaires	
	In-person vs. online modality CHANGE comparison (N=514)	
	2-4-month Difference ¹	9-month Difference ¹
Behaviors (days over the past 7 days) (Mean (SD))		
Eat at fast-food restaurant	0.1 (1.3)	0.3*** (1.2)
Eat at another restaurant	-0.04* (1.3)	0.1 (1.4)
Eat pizza	0.0 (1.1)	0.2* (1.2)
Any food with salt added at the table or during cooking	0.4 (2.4)	0.5* (2.4)

Behaviors (frequency in the past 30 days) ³ (Mean (SD))		
Add salt to foods at the table	0.5* (1.3)	0.5* (0.1)

¹Positive difference means online improved more. Negative difference means in-person improved more. Difference is calculated by subtracting the online from the in-person change. Significant differences with yellow shading. Boldface indicates statistical significance at *P<0.05, **P<0.01, ***P<0.001

CONCLUSIONS

- In-person and online nutrition education are effective in:
 - Increasing knowledge in WIC participants
 - Improving behaviors related to sodium intake
- Supports potential usefulness of multiple modalities of nutrition education for future WIC services
- Results did not suggest a pattern of one modality being superior over another



Strengths

- Salt intake has high public health importance
- Large, multi-ethnic sample
- Both shorter (2-4-months) and longer (9-months) endpoints
- Real world study setting

Limitations

- No control group
- Generalizability
- Different follow-up questionnaire method

PROJECT INFORMATION

The study was funded by USDA/ARS (#101854810)

¹ Nutrition Policy Institute, Division of Agriculture and Natural Resources, University of California, 2115 Milvia Street, Suite 301, Berkeley, CA, 94704, 510-642-5572; npi.ucanr.edu.

² Public Health Foundation Enterprises - WIC, 12781 Schabarum Ave., Irwindale, CA 91706, (626) 856-6650 x309