

Effect of health-literate design for an online planning tool on unhealthy snacking behaviour: An experimental study

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Background

- The **Universal Precautions Approach** recommends that everyone benefits from resources or interventions that are designed for a lower health literacy audience. This includes, for example:

Simple language
and images

Teach-back
method

Encouraging
question-asking

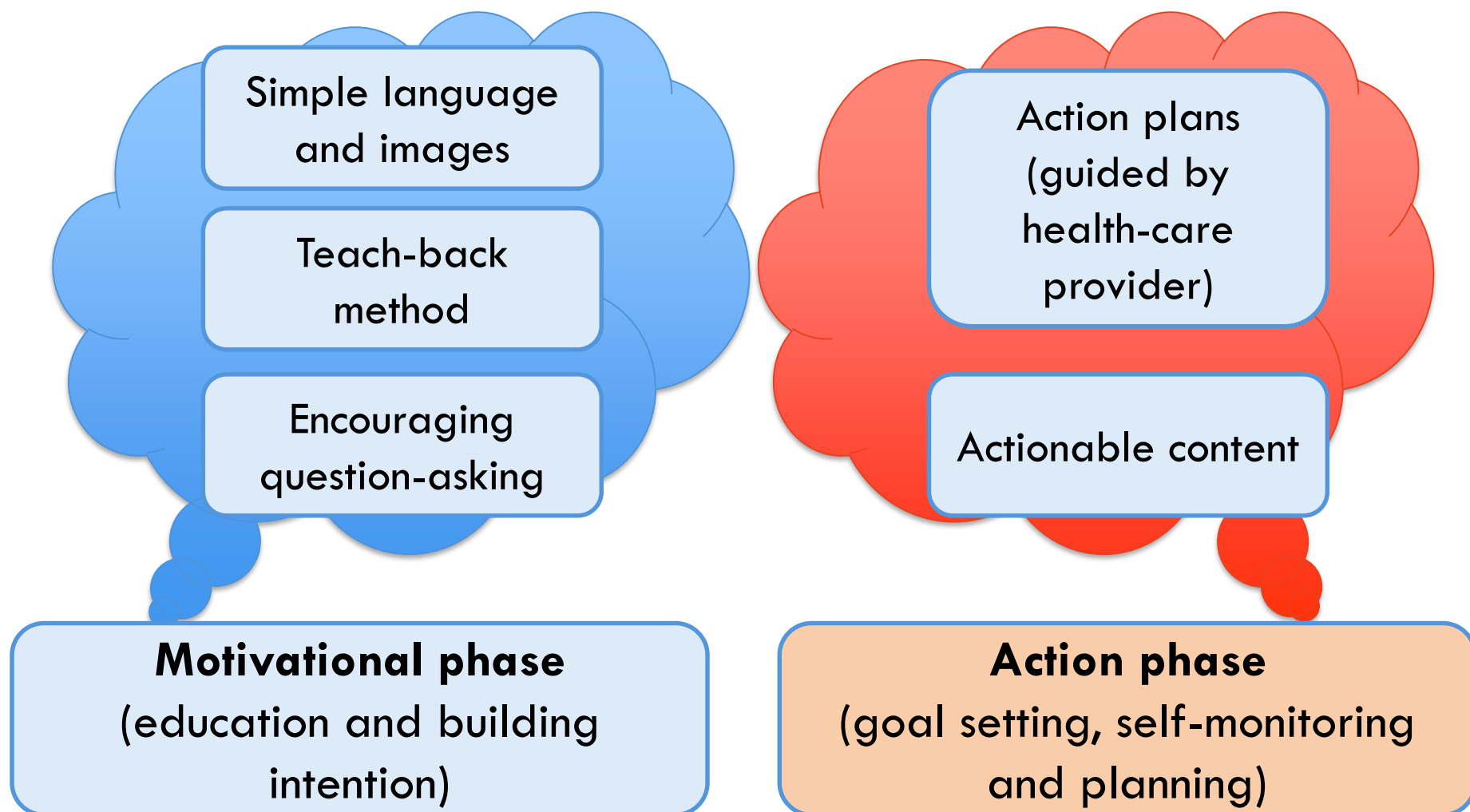
Action plans
(guided by
health-care
provider)

Actionable content

- Resources that incorporate these strategies have shown to increase **knowledge, understanding** and **some behaviours** such as screening uptake
- It is less clear how these strategies impact on more **complex behaviours** such as lifestyle change and self-management


Background

- From a behavioural science perspective we can think of these strategies as part of 2 phases




Background

- HL research to date focused on motivational phase
- Increasing evidence of the importance of the action phase to support behaviour change (esp self management)
- Aim is reduce the *intention-behaviour* gap



Motivational phase
(education and building
intention)

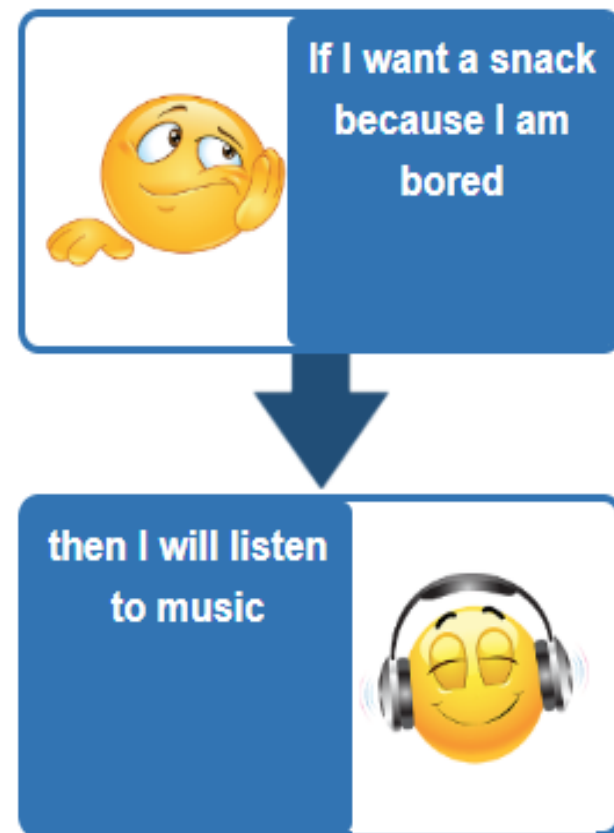


Action phase
(goal setting, self-
monitoring and planning)

Background

Action

- Our work focused on **planning**
- **Planning is hard!**
- **Implementation intentions** are an effective **planning strategy** that target the action phase of behaviour change.
- They are most effective when they are relevant to the individual's needs and preferences.
- **Volitional help sheets (action plans)** are a type of implementation intention that guide the user to select the most relevant cues and responses from a predetermined list. (Armitage, 2008)
- But they have not previously been examined in a low HL population

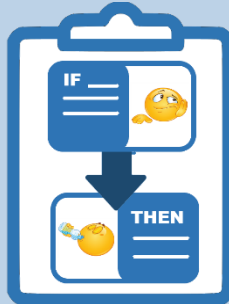


Aim

- To evaluate effectiveness of an online health-literate action plan intervention to reduce unhealthy snacking.

Health-literate action plan

- Simple language
- White space
- Images
- Select 1 cue and 1 response



Standard action plan

- Instructions to identify cues and responses
- Free text response



Education

- Healthy snacking fact sheet



Methods

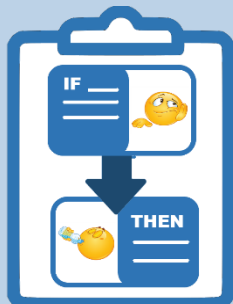
Baseline (N=440)

Baseline: demographics, health literacy (NVS), snacking, habit strength, intention, cognitive variables

Randomisation to intervention group

Health-literate action plan

- Simple language
- White space
- Images
- Select 1 cue and 1 response



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Education

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Reminders at baseline, 1 week and 2 weeks

Follow-up at 4 weeks (N=373 (85% retention))

Follow-up: snacking, intention, cognitive variables

Results

Baseline N=440; Follow-up N=373 (85% retention)

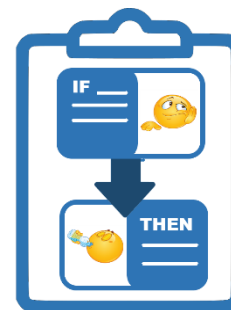
Demographic variables	N (%)	Health literacy and cognitive variables	N (%)
Age (years)		Health literacy (NVS score)	
30-40	124 (33.2)	High likelihood of limited health literacy	88 (23.6)
41-50	81 (21.7)	Possibly limited health literacy	92 (24.6)
51-60	85 (22.8)	Adequate health literacy	193 (51.7)
> 60	83 (22.3)		
Female	190 (50.1)	Baseline cognitive variables (scale range)	Mean (SD)
Speaks English at home	354 (94.9)	Intention (1 low – 7 high)	5.1 (1.4)
Education		Habit strength (1 low – 7 high)	3.7 (1.4)
Less than high school education	15 (4.0)		
High school graduate	63 (16.9)		
Certificate	80 (21.4)		
University education	215 (57.6)		
Self-reported BMI (kg/m²)	218 (58.4)		
Underweight (<18.5)	8 (2.1)		
Normal weight (18.5-24.9)	147 (39.4)		
Overweight (25.0-29.9)	116 (31.1)		
Obese (≥ 30.0)	102 (27.3)		

Results

Multiple linear regression model predicting snack serves per week ($F_{(9, 363)} = 9.0, p < 0.001, R^2 = 0.18$)

Predictors	B (95% CI)	p value
Intercept	15.91 (13.37-18.46)	<0.01
Age (years)	-0.18 (-0.39-0.03)	0.10
English spoken at home	-4.69 (-16.58-7.20)	0.44
Education	4.14 (-1.04-9.33)	0.12
Baseline snack score	0.49 (0.36-0.62)	<0.01
Health literacy (NVS score)	-1.65 (-2.98—0.33)	0.01
Contrast 1: health-literate action plan vs standard action plan	-0.38 (-3.49-2.72)	0.81
Contrast 2: health-literate action plan/standard action plan vs education	-2.17 (-5.84-1.50)	0.25
Contrast 1*health literacy (NVS score)	1.74 (0.20-3.28)	0.03
Contrast 2*health literacy (NVS score)	0.51 (-1.35-2.37)	0.59

Contrast 1



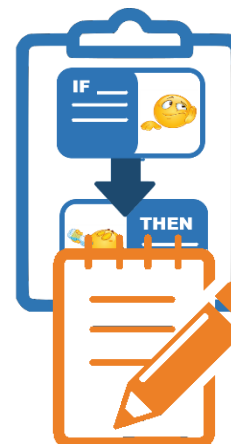
Health-literate

vs



Standard

Contrast 2



vs



Education

Results

Multiple linear regression model predicting snack serves per week

Predictors	B (95% CI)	p value
Intercept	15.91 (13.37-18.46)	<0.01
Age (years)	-0.18 (-0.39-0.03)	0.10
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Lower health literacy associated with unhealthy snacking at follow-up

No main effect of type of action plan on snacking at follow-up

Interaction effect of type of action plan x health literacy on snacking at follow-up

Results

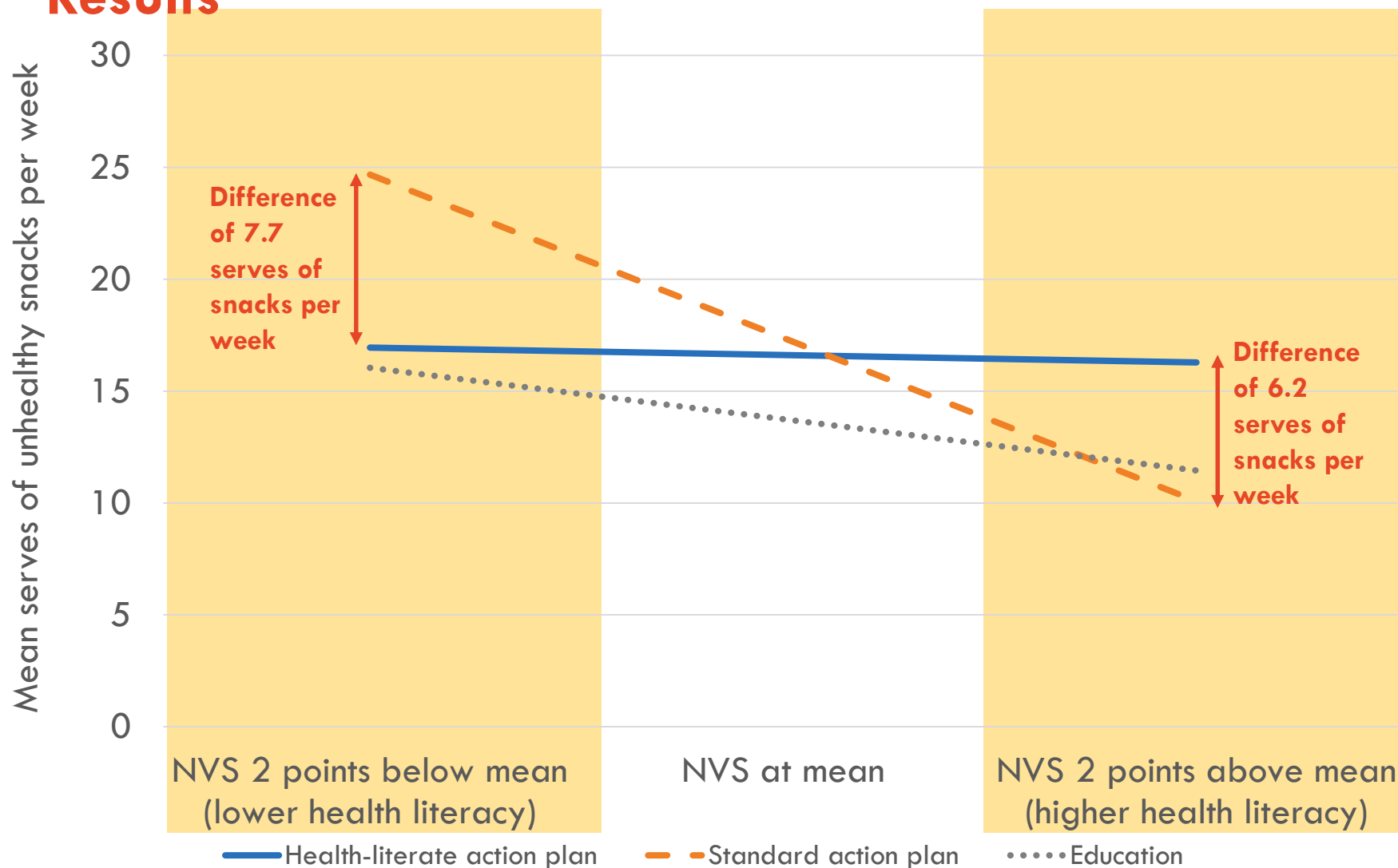


Figure 2: Predicted unhealthy snack serves per week by intervention group and health literacy score*

*Analysis controlled for age, language spoken at home, education and baseline snacking score.

Results

Characteristics of standard action plans by health literacy level

Plan characteristic	Low health literacy N (%)	Adequate health literacy N (%)
A. Evidence that participants followed <i>standard action plan</i> instructions:		
No plan created	10 (33.3)	9 (12.9)
Plan was not specific (e.g. "eat less junk food")	8 (26.7)	9 (12.9)
Plan identified cues for unhealthy snacking	2 (6.7)	21 (30.0)
Plan identified a solution for unhealthy snacking	11 (36.7)	52 (74.3)
B. Evidence that participants may have benefited from <i>standard action plan</i> because of added flexibility/customisability		
Plan involved removing unhealthy snacks from the environment or making healthy snacks easily available	3 (10.0)	25 (35.7)
Plan identified a personal solution not presented in health-literate planning tool	3 (10.0)	34 (48.6)
Total number of participants	30	70

Implications for health literacy interventions

1. Body of research now suggests that action control processes can increase the effectiveness of behaviour change interventions (Systematic review: Michie et al., 2009)
2. But these interventions may be complex
3. Action plans for adults with low health literacy which reduce the cognitive demand are more effective
4. People with higher and lower health literacy may benefit from different (and tailored) action plan strategies to support effective behaviour change

Limitations

1. Outcomes of snacking behaviour are self reported but study randomised so any error/ bias should be same across arms
2. More research using other dietary measures such as food diaries would be helpful
3. This is the first study where we have found such an effect, we are planning more studies to investigate this further.
4. Research examining different behaviours is also needed

Conclusions: optimizing behaviour change

Universal precautions may be best for the motivational phase and tailoring by HL may be optimal in the Action Phase to support behaviour change



Universal precautions

Motivational phase
(education and building
intention)

Tailored by HL

Action phase
(goal setting, self-monitoring
and planning)

Thank you

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