An Implementation-Oriented Evaluation Framework for Multi-domain Lifestyle Dementia Prevention Interventions: Development and Application in the HERITAGE Cluster Randomized Controlled Trial

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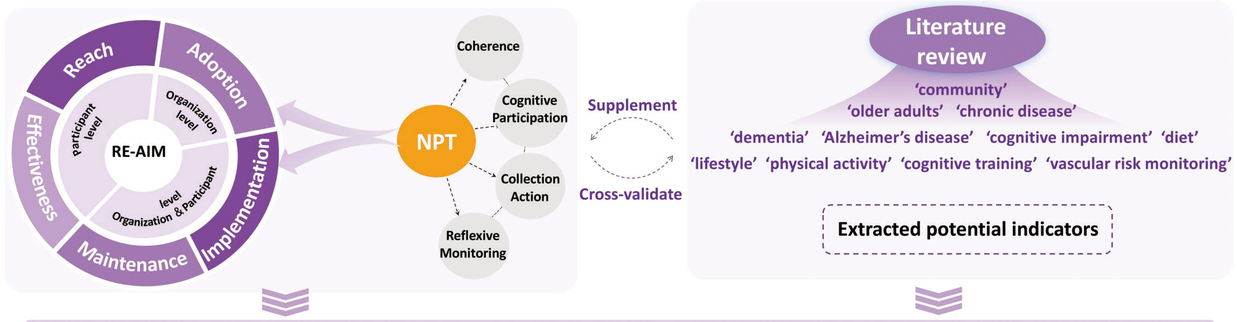
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INTRODUCTIONS

- **Background:** While multi-domain lifestyle interventions demonstrate efficacy in slowing cognitive decline, their community-level implementation remains challenging due to variable local resources and quality assurance. Standardized frameworks for comprehensive implementation evaluation are notably lacking.
- **Objective:** To develop an implementation-oriented evaluation framework for multi-domain lifestyle dementia prevention interventions and apply it to the HERITAGE Study (The Multi-domain Lifestyle Intervention for Cognitive Impairment in Community-Dwelling Older Adults in Hangzhou)

METHODS

(A) Theoretical architecture and constructs



A draft evaluation framework and a indicator set was developed.

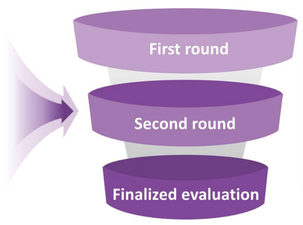
(B) e-Delphi consensus and indicator selection

Experts Inclusion:

(1) Dementia or cognitive impairment expertise;

(2) Mid-level professional title or ≥ master's degree;

(3) Informed consent and willingness to complete consultation.



Indicators Inclusion:

Percent agreement > Mean-SD (Threshold)

Arithmetic mean > Mean-SD (Threshold)

CV < Mean+SD (Threshold)

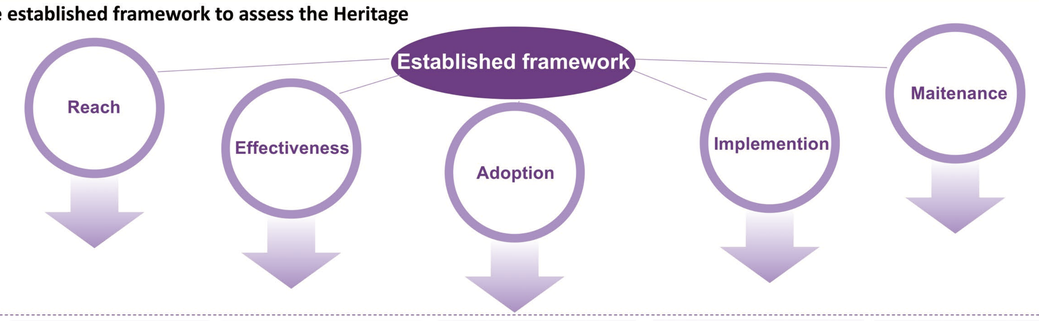
Expert positivity: Response rate

Expert authority coefficient: Composite reliability coefficient

Expert coordination coefficient: Kendall's W coefficient

Final evaluation framework was developed.

(C) Applying the established framework to assess the Heritage



	Reach	Effectiveness	Adoption	Implemention	Maitenance
Quantitative data	·Recruitment database ·Work logs	·NTB ·Structured physical fitness tests ·GDS ·Physical measurements	·Recruitment database	·Attendance records ·Work logs	·Self-administered questionnaire
Quanlitative data	·Semi-structured interviews for implementers or researchers	·Semi-structured interviews for participants	·Semi-structured interviews for implementers	·Semi-structured interviews for implementers	·Semi-structured interviews for participants

RESULTS

Dimensions and Indicators		Pre	During	Post
		Implementation Stage		
Reach	Number of Participants	●		
	Participation Rate	●		
	Representativeness of Participants	●		
	Potential Recruitment Bias	●		
Effectiveness	Changes in Cognitive Function (primary outcome)	●		●
	Changes in Physical Function (secondary outcome)	●		●
	Changes in Mental Health (secondary outcome)	●		●
	Changes in Vascular Risk Factors (secondary outcome)	●		●
	Self-Perceived Attainment of Health Management			●
Adoption	Organizational Adoption Rate	●		
	Comprehension, Recognition, and Agreement of the Intervention Protocol (coherence construct of NPT)	●	●	
	Perception of Routine Integration (coherence, cognitive participation, and collective action constructs of NPT)		●	●
Implementation	Implementation Fidelity		●	●
	Protocol Adaptations and Reasons		●	●
	Participant Attendance Rate		●	●
	Facilitators to Implementation			●
	Barriers to Implementation			●
	Perceived Quality of Implementation			●
Maintenance	Organizational Maintenance Intention Rate			●
	Participant Maintenance Intention Rate			●
	Determinants of Sustained Engagement to Participant Maintenance			●

CONCLUSTIONS

This study establishes an implementation-oriented evaluation framework and applies it to the HERITAGE Study, providing a comprehensive, standardized tool for quality improvement and appraisal of multi-domain lifestyle interventions within the WW-FINGER network.