Culinary Nutrition Education for Promoting Healthy Eating Among Kids

Assoc. Prof. Dr Satvinder Kaur / Dr Ng Choon Ming
Department of Food Science and Nutrition,
Faculty of Applied Sciences,
UCSI University

Disclosure

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The funder had no role in the study.

We have no conflicts to disclose.

Background

Healthy eating pattern: Nutrients for optimal health, prevention of chronic diseases/obesity [1]

- **Children worldwide did not meet dietary guidelines. irrespective of sociodemographic background** [2]
- **Food pickiness & taste preference for unhealthy food, despite having nutrition knowledge** [3]

A Different Approach for Behavior Change

Creating a healthy relationships w foods & preference for healthy foods in a fun manner to drive healthy dietary practices

- ✓ **Child behavior: Learn by doing, seeing & experiencing** [4]
- ✓ **Experiential learning: Play as a medium for learning**
- ✓ **More than knowledge: Practical skills to eat healthy, transforming basic foods to nutritious meals**

Introducing Culinary Nutrition Education

KIDS IN THE KITCHEN

Study Aim

To evaluate the effectiveness of a culinary nutrition education intervention on children's:

1. **Psychosocial factors related to healthy meal preparation:** Knowledge, attitude, practice, self-efficacy
2. **Home food availability:** Vege, fruit, healthful, less healthful food
3. **Dietary practices:** Food group consumption
4. **Weight status:** BMI-for-age, body fat percentage, waist circumference

Methods

Study design

Prospectively registered randomized-controlled trial (RCT) in Kuala Lumpur, Malaysia

Participant

- Healthy Malaysian children
- 10-11 years old
- Can converse in English/Malay

Exclusion

- Physical/ intellectual disabilities
- Medical conditions
- Food allergies

Ethics

- Medical Research & Ethics
- Ministry of Education Malaysia & Kuala Lumpur Federal Territory Education Department
- School principals
- Parent consent & assent

Randomization & Recruitment

Simple random sampling

1 major zone in KL, 2 schools randomly selected from the zone & assigned to intervention/ control

Convenience sampling

- To select children in schools

Sample size

- Formula for RCT (80% power, 5% level of significance) [5]
- 96 children (50% dropout)

Final number

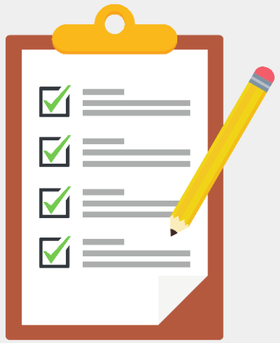
- 83 children completed assessment (15.3% dropout)
- Extracurricular activities, competitions, relocation

Measures

Sociodemographic & Weight Status

Questionnaire & standard protocol [6]

Psychosocial Factors & Home Food Availability

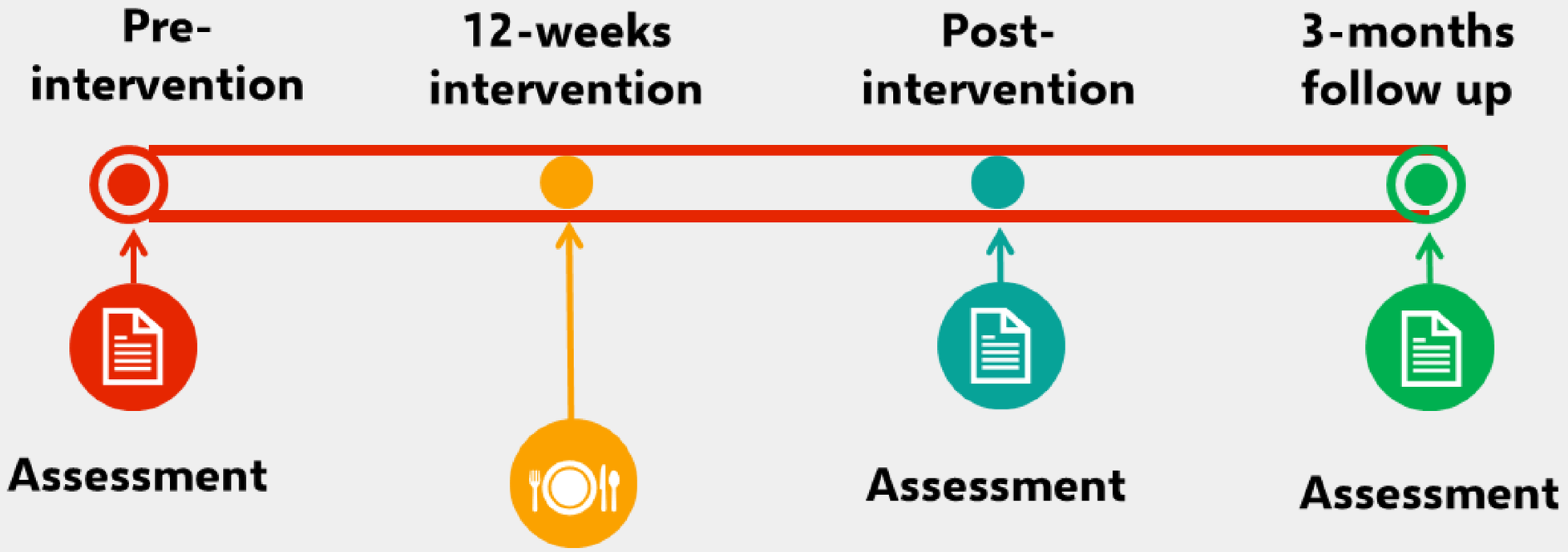


Validated & adapted questionnaires (tested for reliability) [7-10]

Dietary Practices

Adapted guided form [11], as per Malaysian Dietary Guidelines (MDG) & Food Pyramid [12]

Timeline


Pre-
intervention
12-weeks
intervention
Post-
intervention
3-months
follow up
Assessment
Assessment
Assessment

Intervention Development

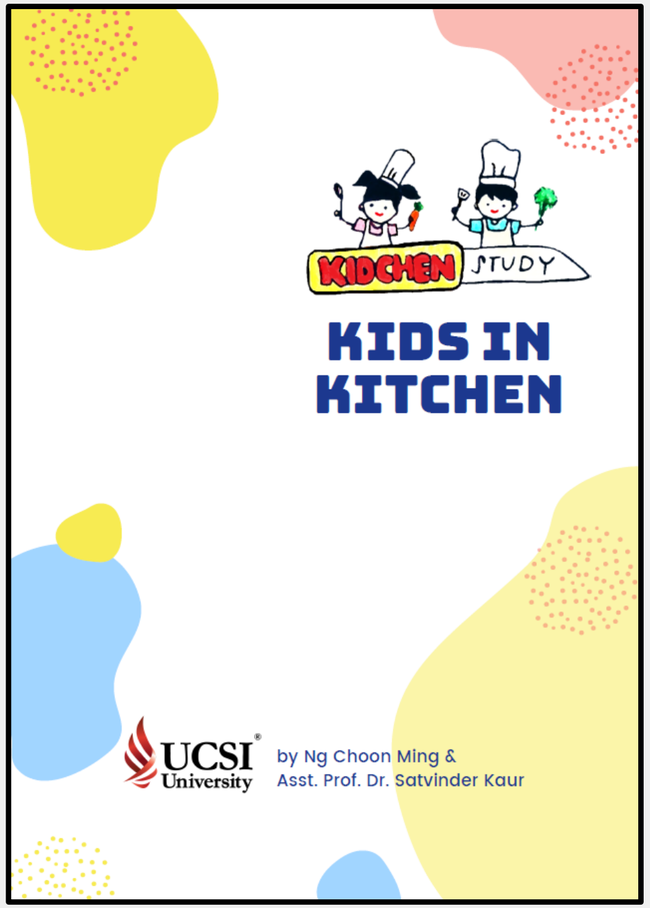
Cross-sectional study[13-14] (n=200 children-parent)

Focus group discussions (n= 16 children)

Evidence-based nutrition guideline

Social Cognitive Theory &
Experiential Learning Theory

Expert panel (2 nutrition academicians, 1 nutritionist in practice, 1 psychologist, 1 school teacher, 1 parent)



Intervention Components

Parent-child:
Home Food Availability

1-hour

*Nutrition talk
*Food labels activity
*Meal tasting
*Apron fitting

Children:
Healthy Meal Preparation

Five 1h sessions every 2 week

*Nutrition education/
Storytelling
*Hands-on meal prep
*Meal sharing

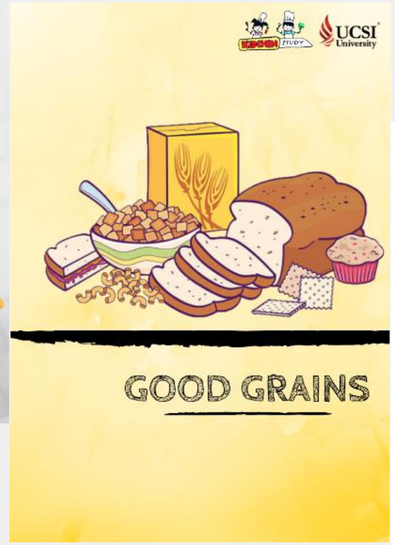
Home:
Provision of ingredients

After each session

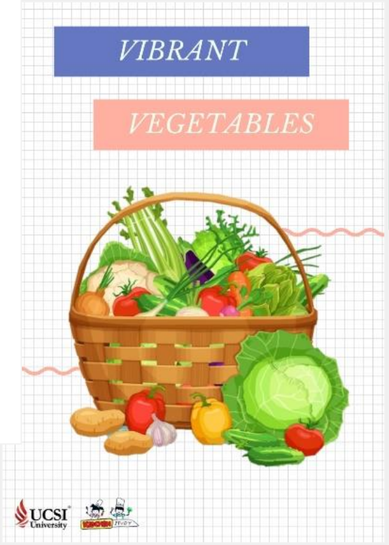
*Provision of
healthy ingredients,
measuring cups &
spoons

Modules

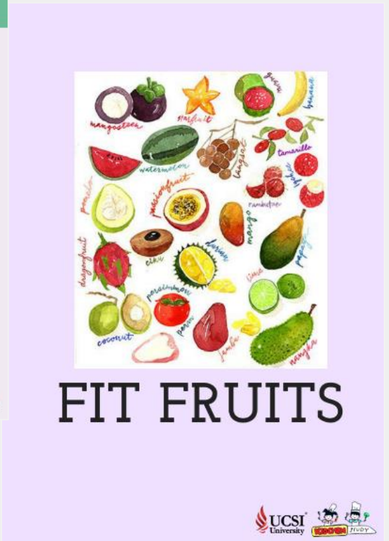

UCSI University
home is where the (healthy) food is


UCSI University
GOOD GRAINS


POWER PROTEIN FOOD
UCSI University


VIBRANT
VEGETABLES
UCSI University


AMAZING DAIRY
UCSI University


FIT FRUITS
UCSI University

Storytelling as a simple yet powerful nutrition education tool

- To convey complex concepts (meaningful & non-threatening)
- Characters: Relate, imagine, feel (emotions)
- Continuity to spark curiosity & excitement

Modules

✓ Nutrition education

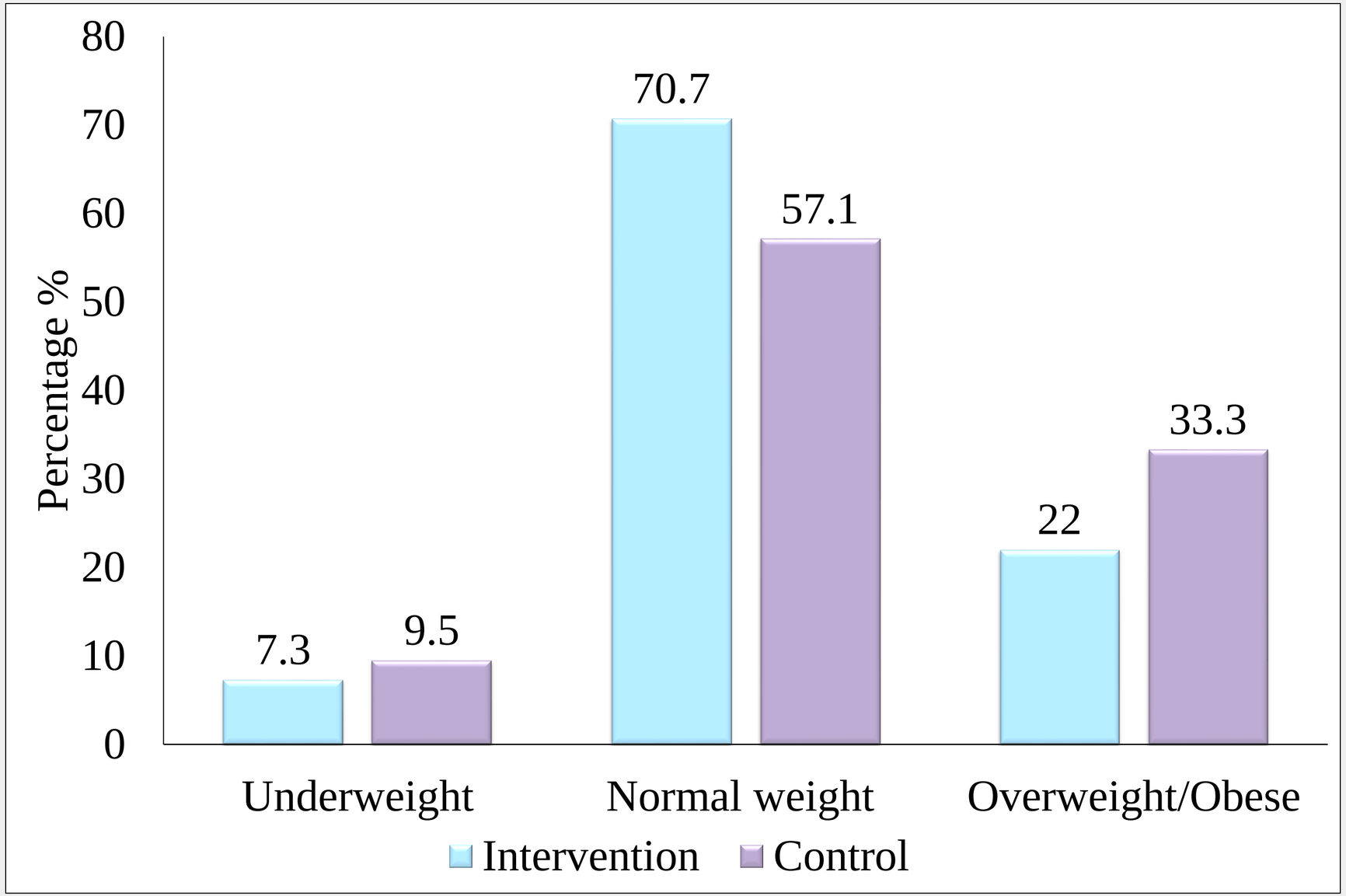
✓ Food skills

✓ Recipes

Children's Characteristics

Variables	Intervention (n=41)	Control (n=42)	p-value
Age (years)			0.44
10	17 (41.5)	14 (33.3)	
11	24 (58.5)	28 (66.7)	
Sex			0.42
Male	14 (34.1)	18 (42.9)	
Female	27 (65.9)	24 (57.1)	
Monthly household income			0.05
Low (≤ MYR 2500)	20 (48.8)	10 (23.8)	
Middle (MYR 2501-RM5500)	12 (29.3)	21 (50.0)	
High (> MYR 5501)	9 (22.0)	11 (26.2)	
Education level			0.15
Primary/Elementary	2 (4.9)	2 (4.8)	
Secondary/High School	18 (43.9)	10 (23.8)	
Tertiary/University	21 (51.2)	30 (71.4)	

Weight Status

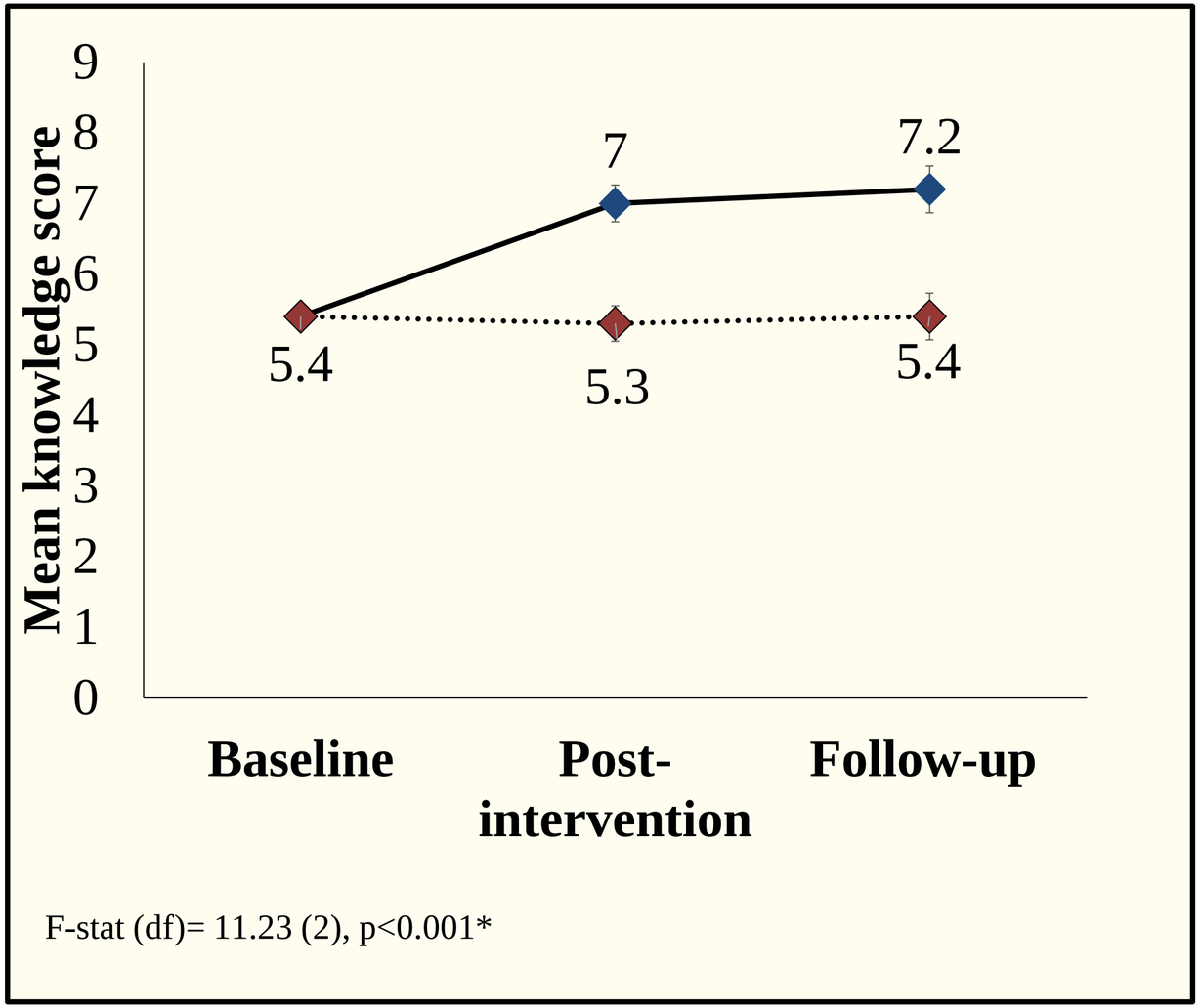


Baseline

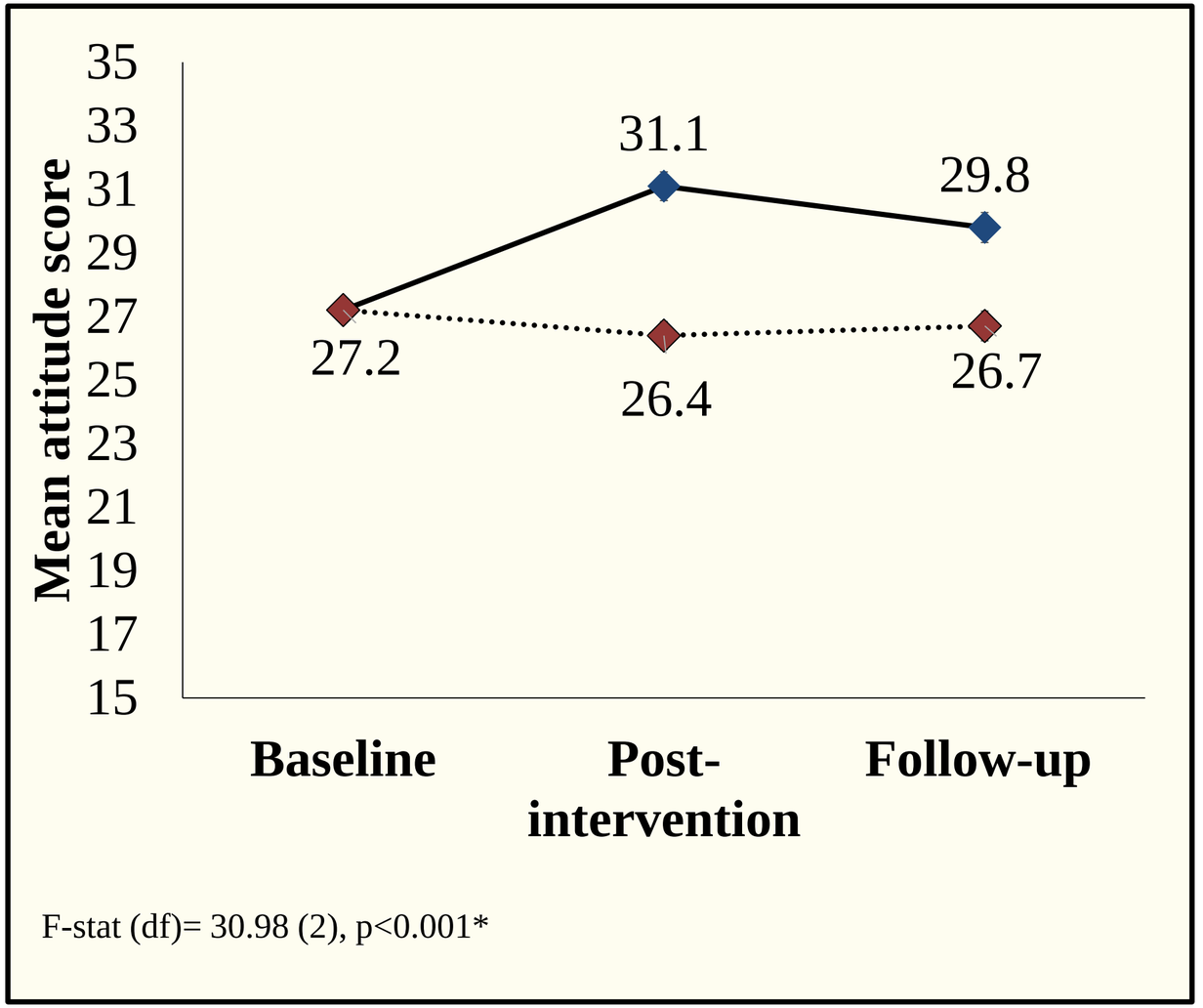
Variables	Intervention (n=41)	Control (n=42)	p-value
Psychosocial factors			
Knowledge	5.5 ± 2.02	5.3 ± 2.17	0.55
Attitude	27.2 ± 3.62	27.2 ± 3.43	0.97
Practice	20.6 ± 4.39	19.6 ± 5.26	0.32
Self-efficacy	34.2 ± 3.62	32.8 ± 5.01	0.15
Home food availability			
Fruits	4.3 ± 2.64	5.0 ± 2.53	0.27
Vegetables	8.1 ± 3.06	8.5 ± 3.30	0.57
Healthful foods	3.9 ± 2.49	4.3 ± 1.78	0.39
Less healthful foods	6.1 ± 2.23	5.7 ± 2.38	0.40

Data reported in mean ± SD, analyzed with independent samples t-test

Intervention Outcomes: Knowledge & Attitude

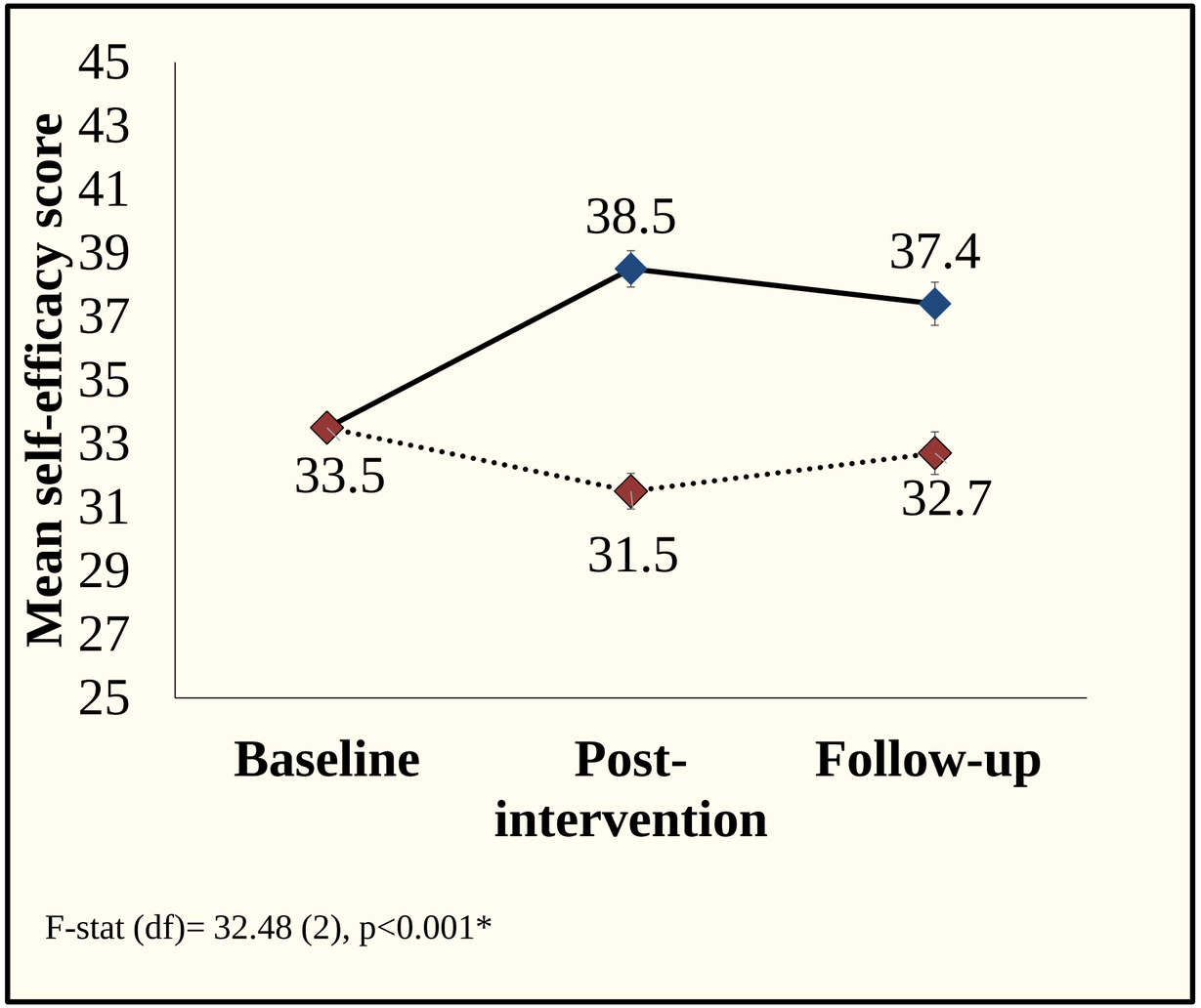


F-stat (df)= 11.23 (2), p<0.001*

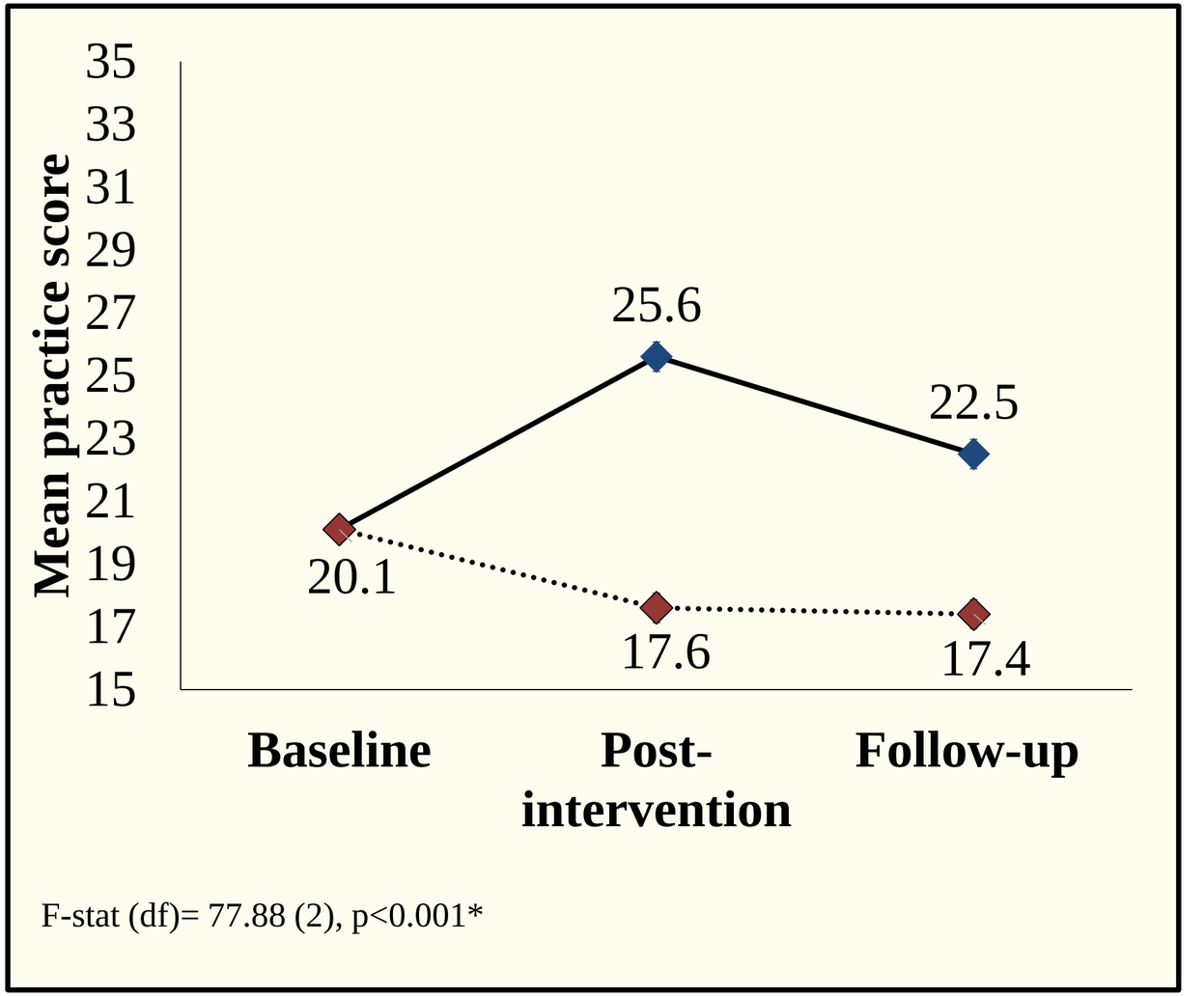


F-stat (df)= 30.98 (2), p<0.001*

Self-Efficacy & Practice

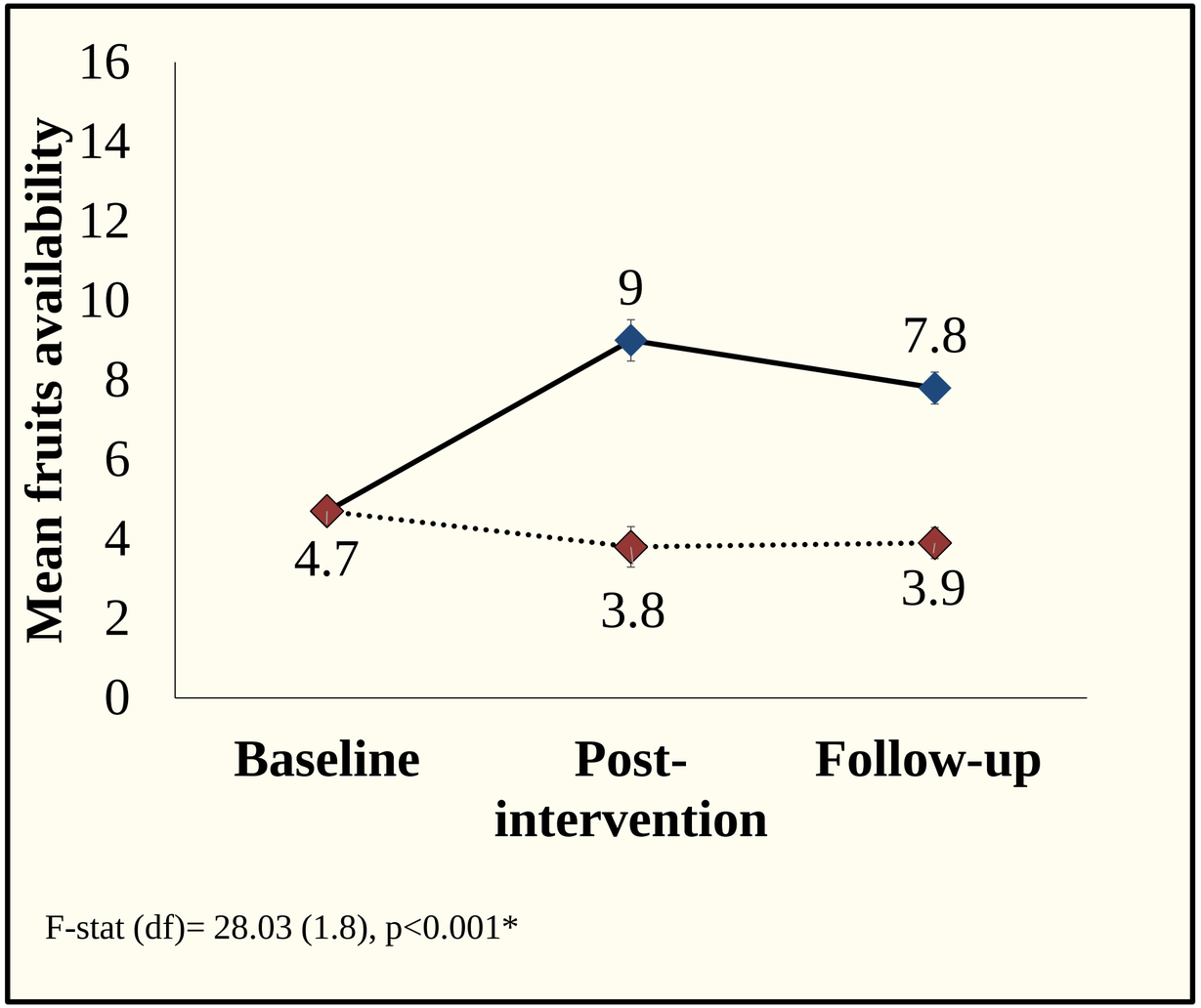


F-stat (df)= 32.48 (2), p<0.001*

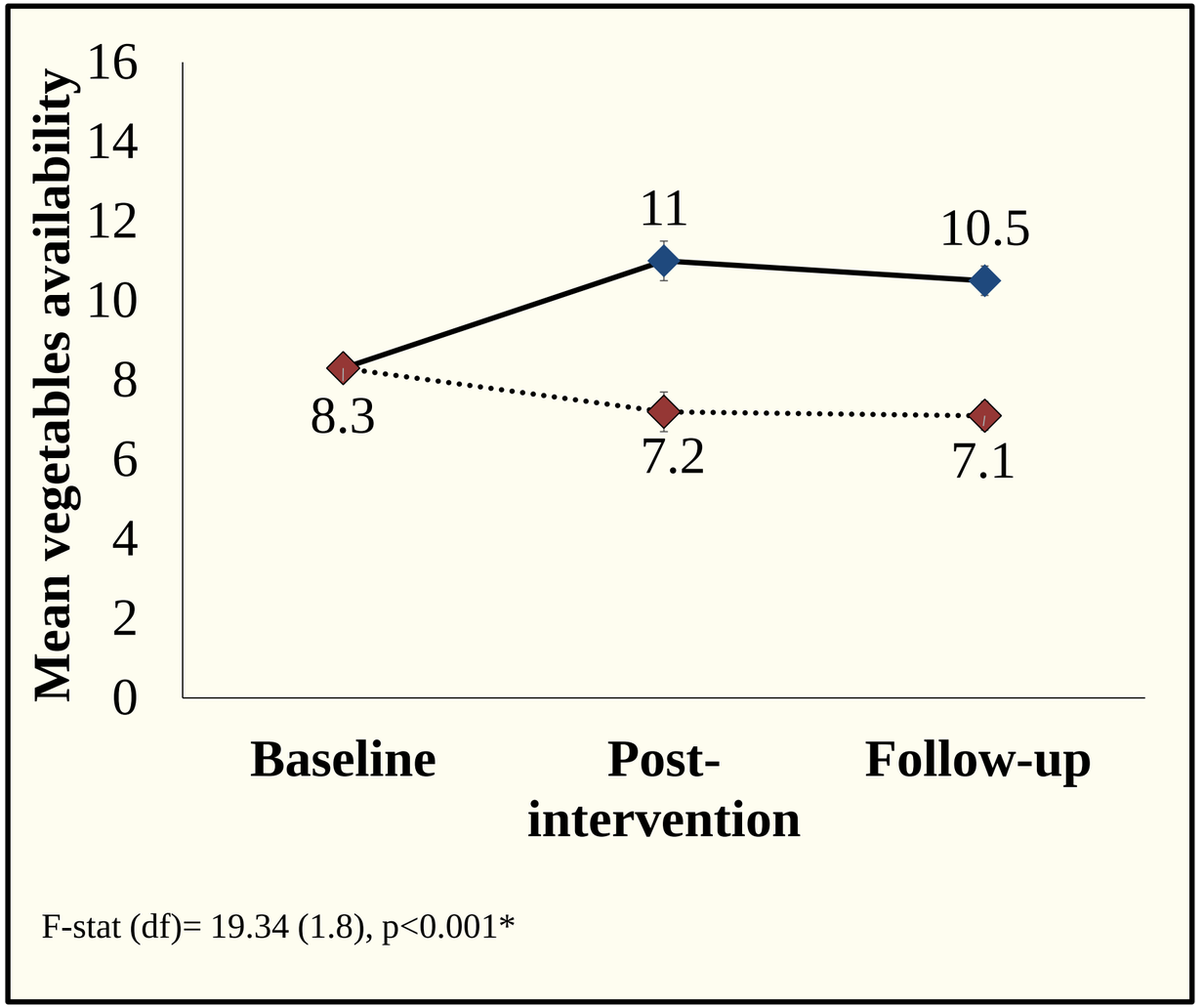


F-stat (df)= 77.88 (2), p<0.001*

Fruits & Vegetable Availability at Home

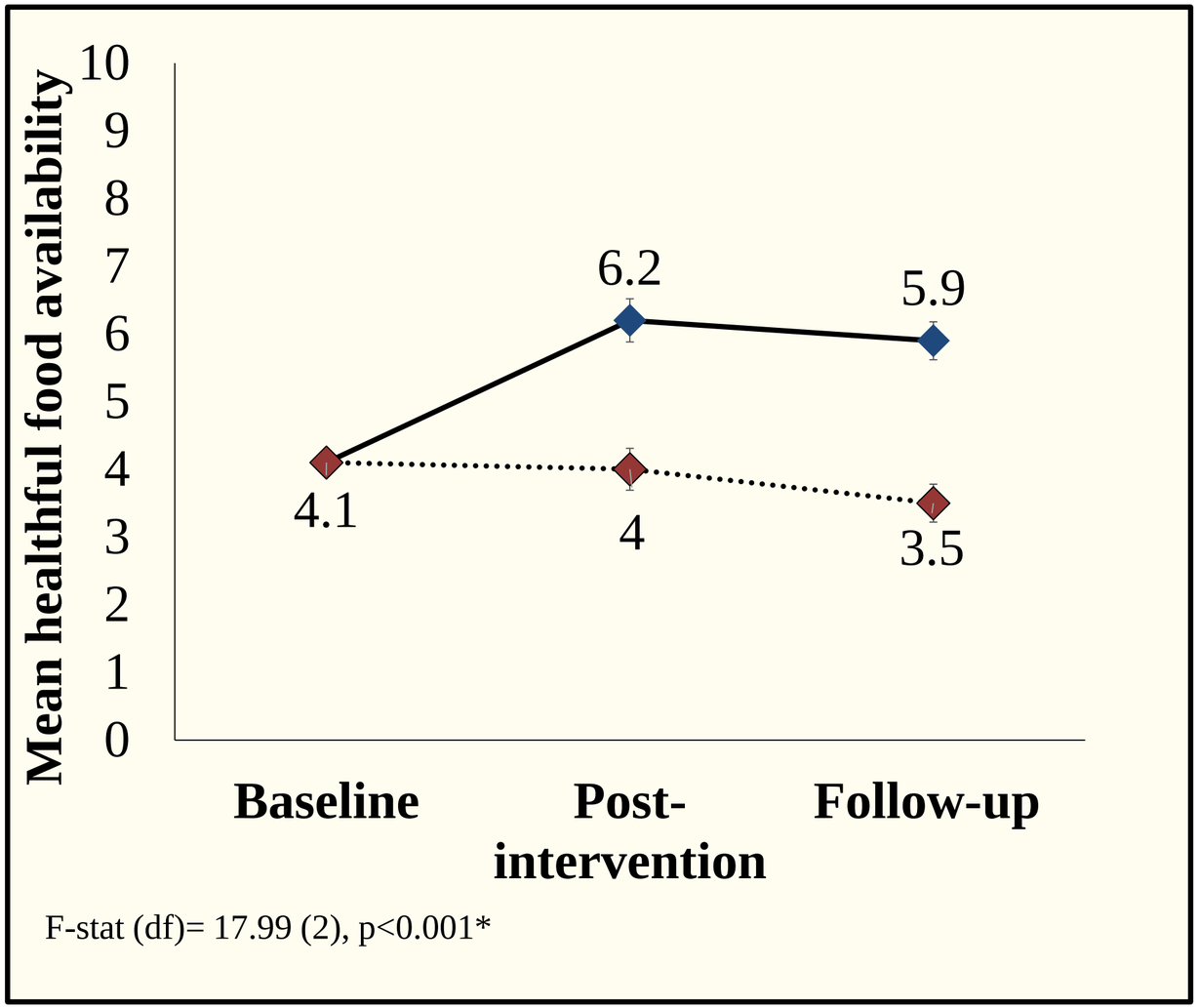


F-stat (df)= 28.03 (1.8), p<0.001*

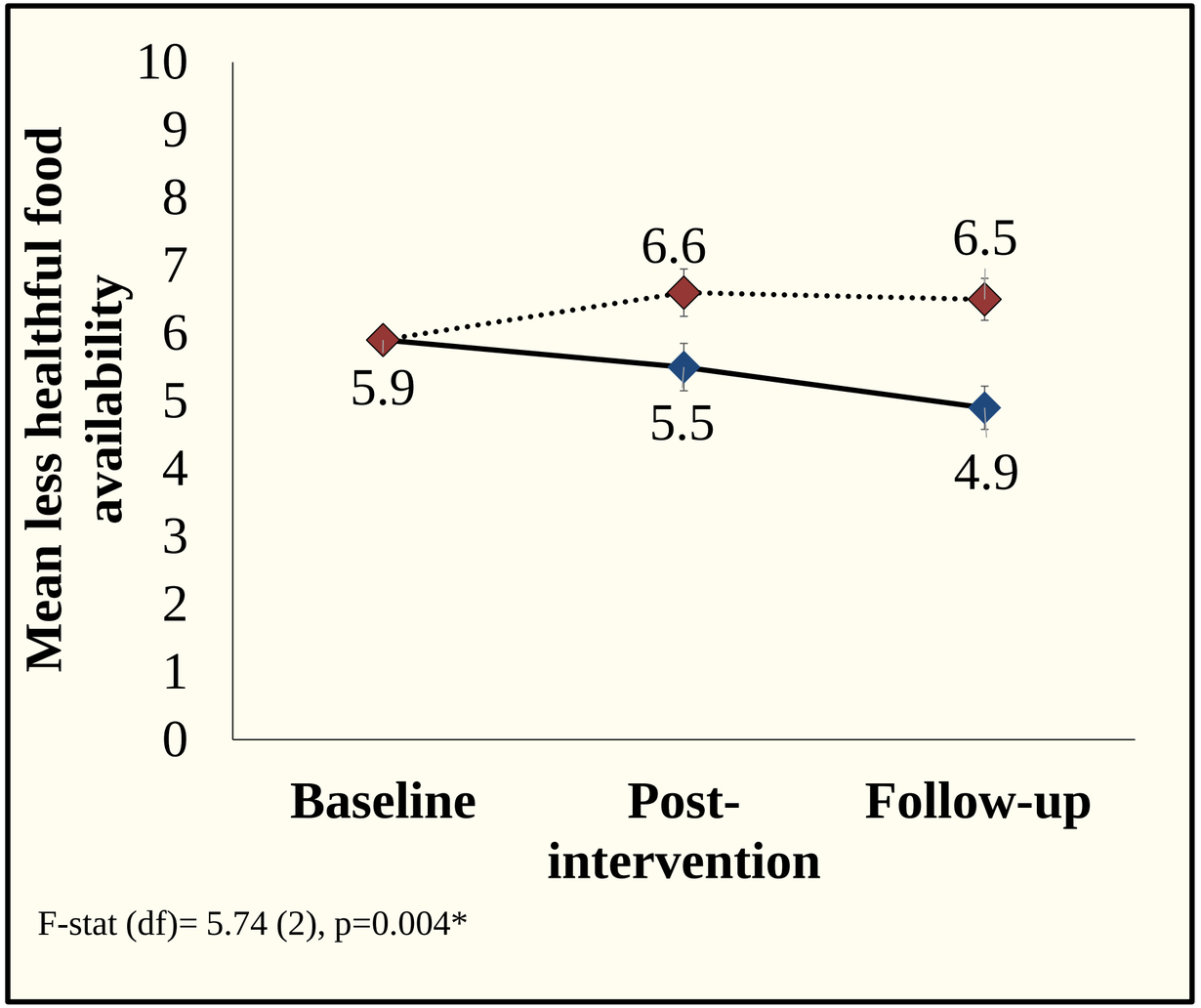


F-stat (df)= 19.34 (1.8), p<0.001*

Healthful & Less Healthful Foods at Home



F-stat (df)= 17.99 (2), p<0.001*



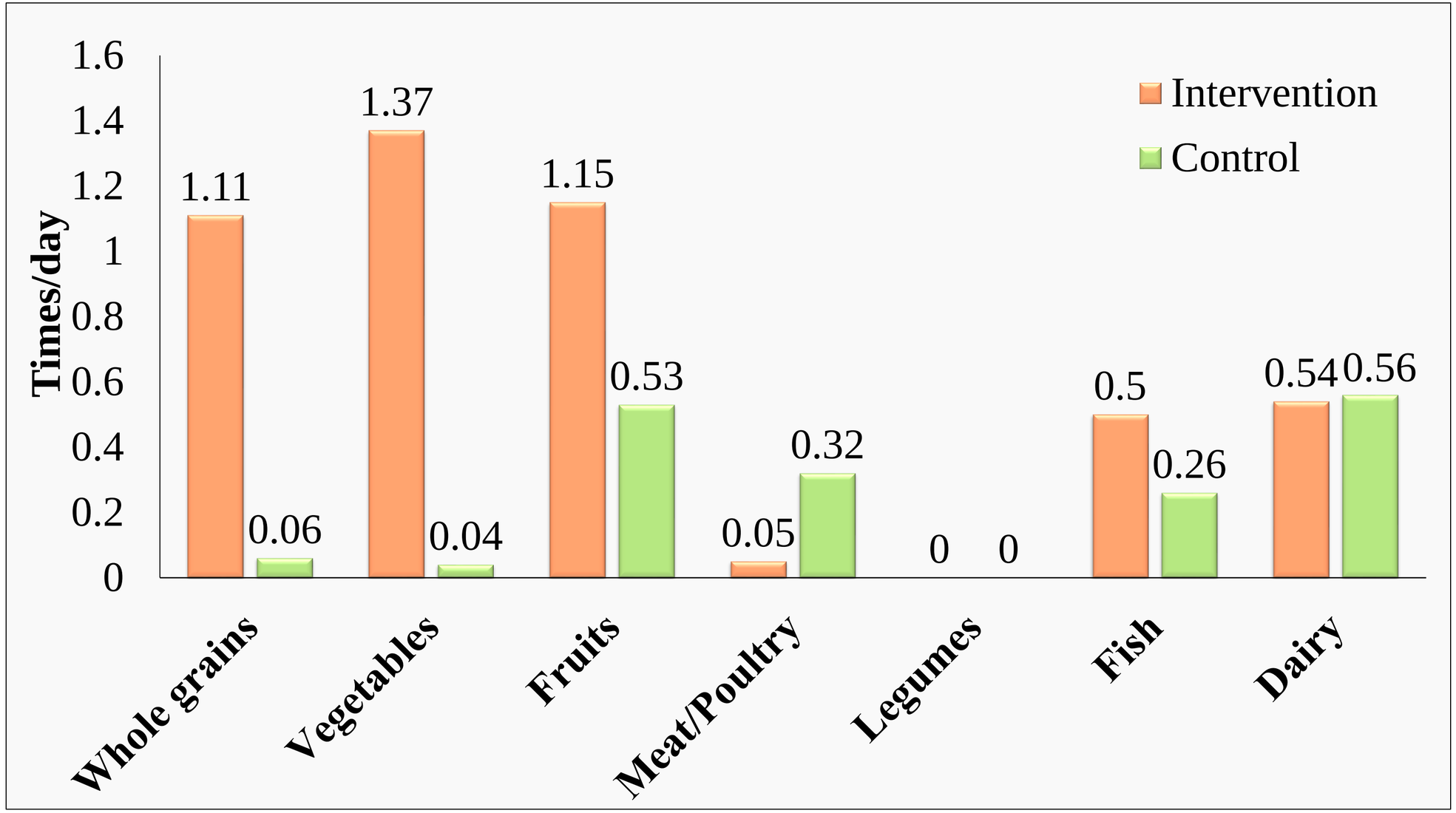
F-stat (df)= 5.74 (2), p=0.004*

Food Groups Consumption at Baseline

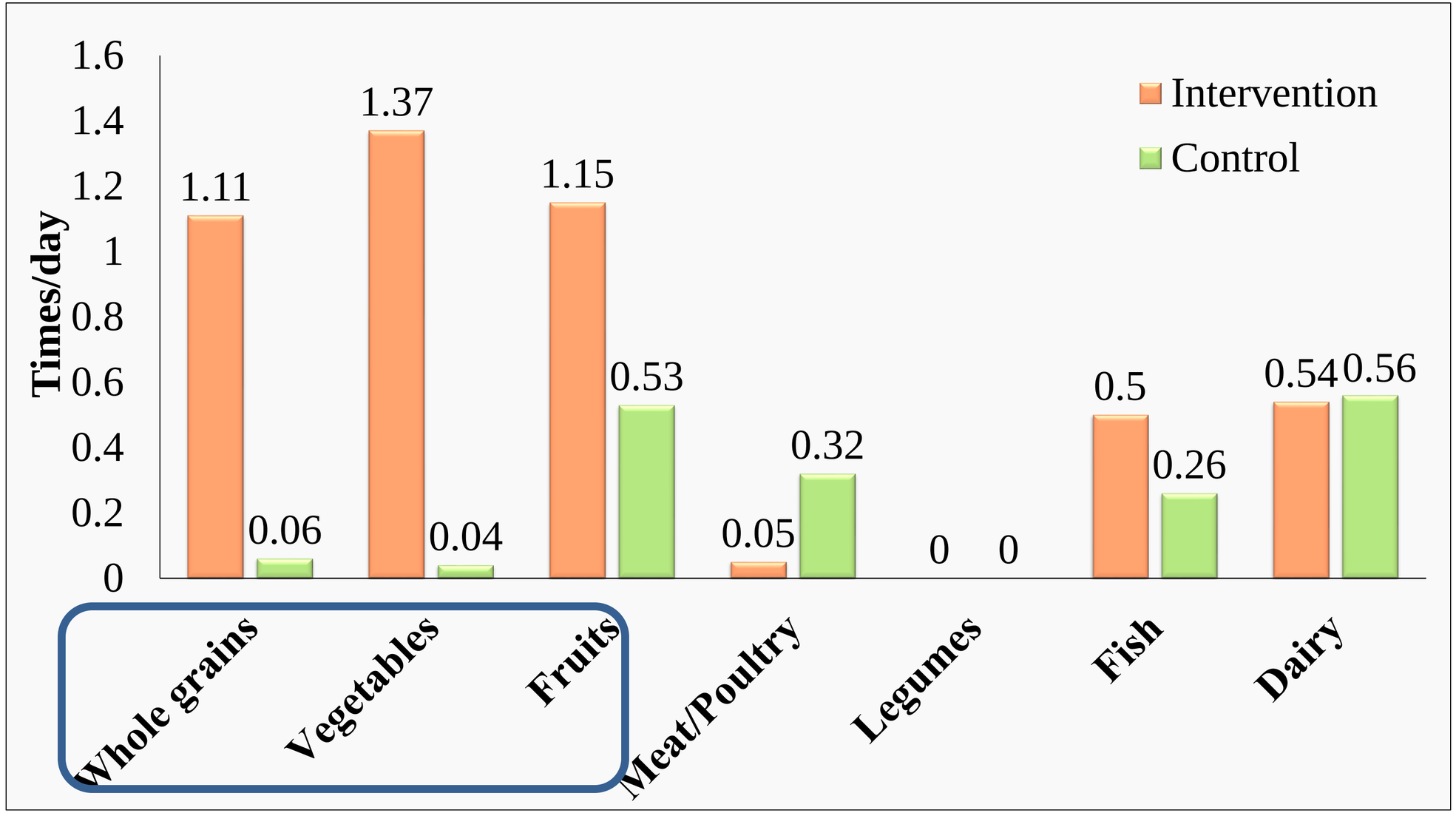
Food group consumption (times/day)	Intervention (n=41)	Control (n=42)	p-value
Whole grains	0.72 (1.86)	0.14 (1.25)	0.175
Refined grains#	3.02 (0.92)	3.10 (0.80)	0.680
Vegetables	1.00 (1.75)	1.39 (1.29)	0.553
Fruits	1.43 (1.50)	1.60 (2.55)	0.880
Meat/poultry#	2.02 (1.11)	2.18 (1.29)	0.533
Legumes	0.00 (0.00)	0.00 (0.09)	0.536
Fish	0.71 (1.47)	1.00 (1.73)	0.800
Dairy	1.00 (2.25)	0.71 (1.85)	0.305
Processed foods#	2.64 (1.18)	3.32 (1.02)	0.006*
Sweetened beverages#	1.42 (1.23)	2.21 (1.50)	0.010*

Data reported in median (IQR) and analyzed with Mann-Whitney U test.
#Data reported in mean (SD) and analyzed with independent samples t-test

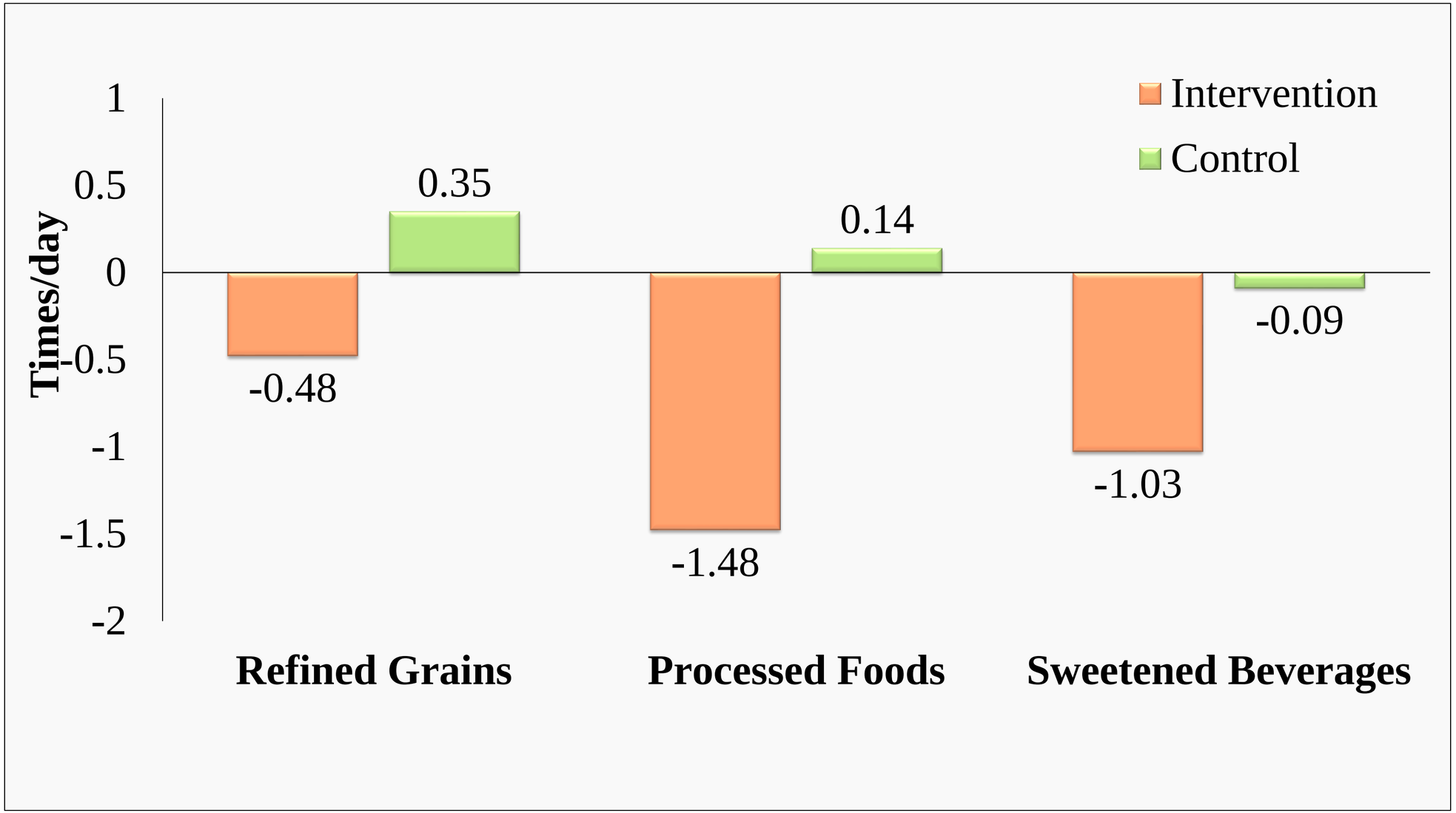
Change in Food Group Consumption



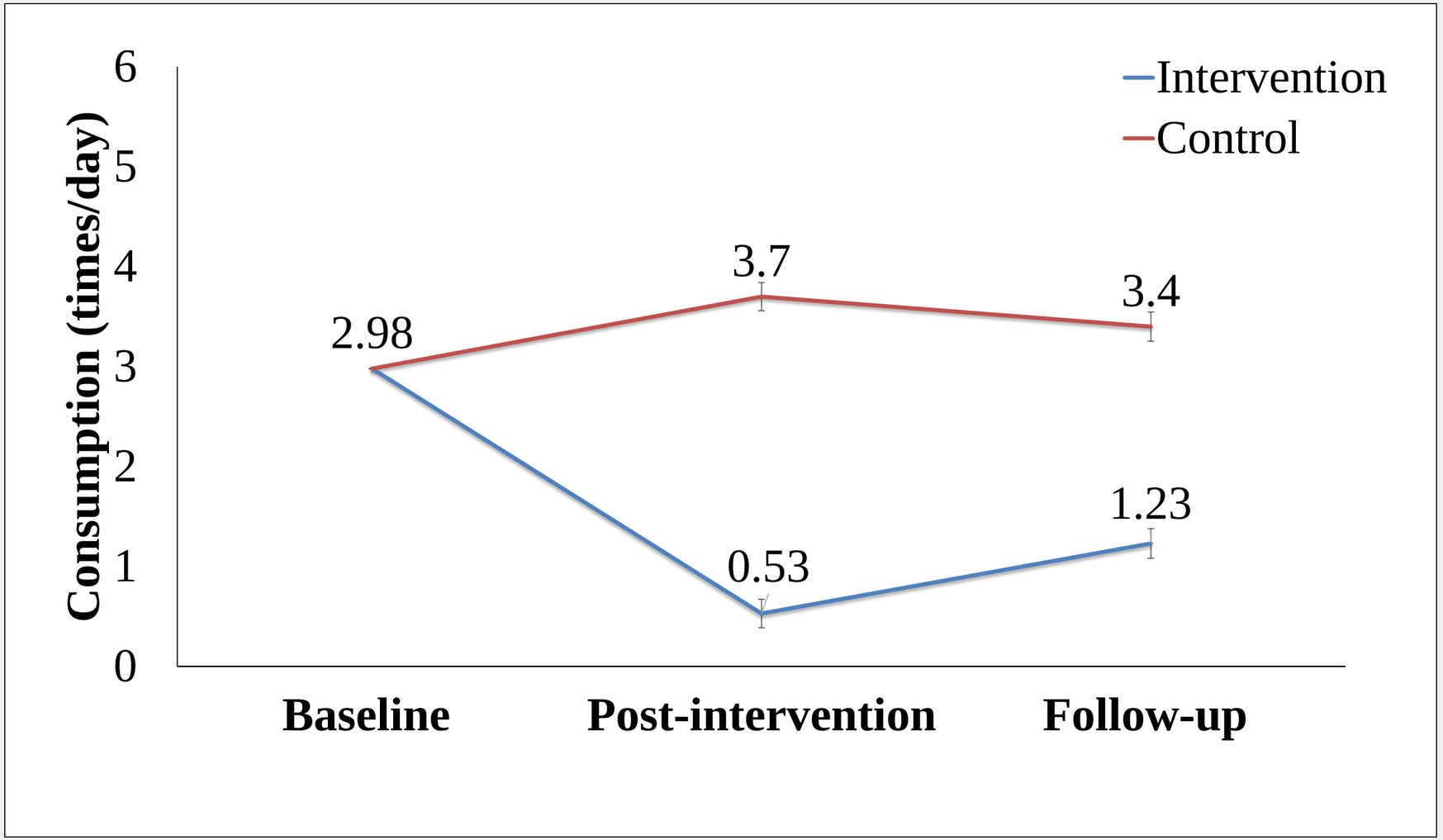
Change in Food Group Consumption



Change in Unhealthy Food Group Consumption*

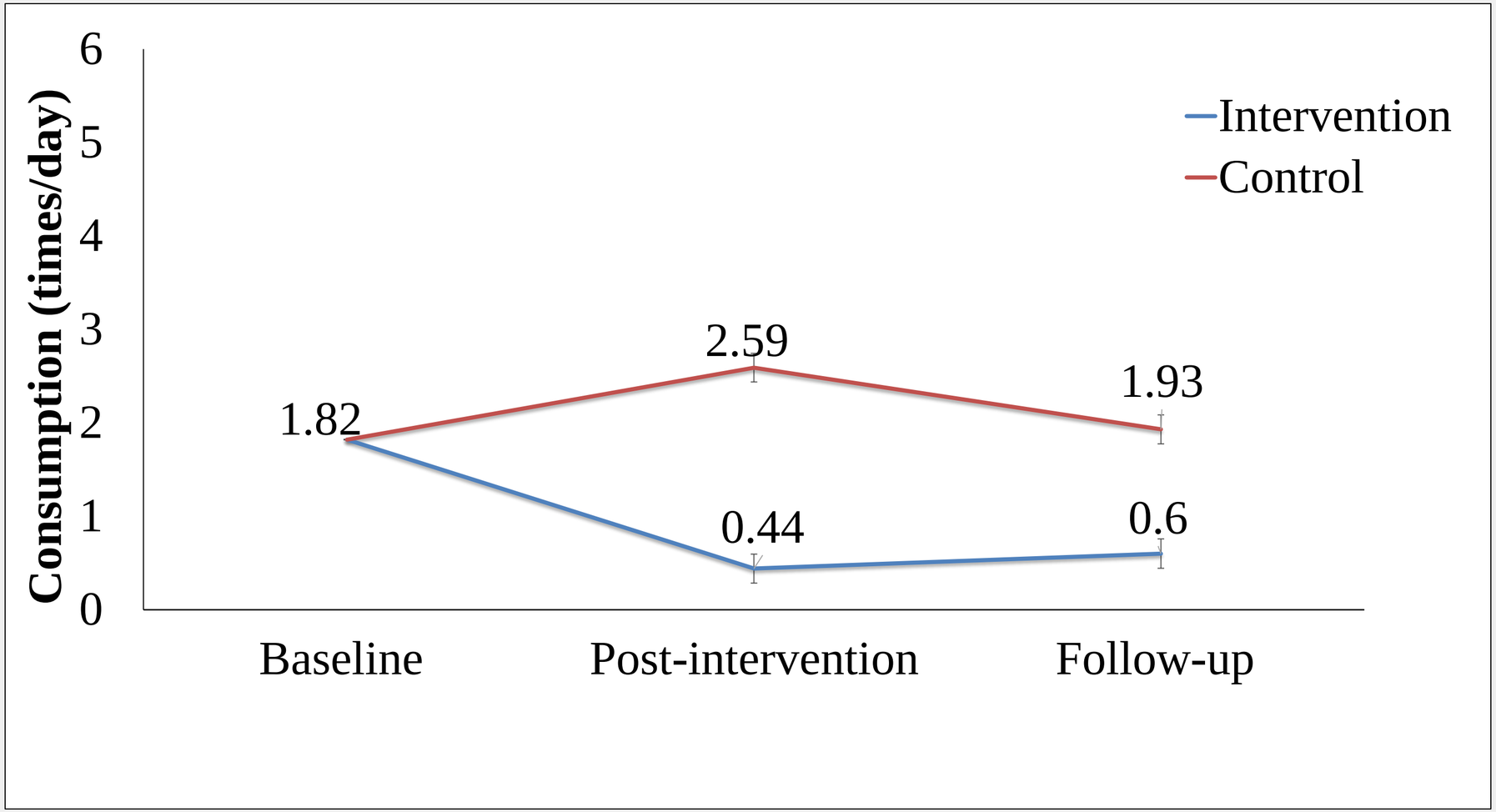


Processed Foods*



F-stat (df)= 49.74 (2), η^2= 0.608, p<0.001*

Sweetened Beverages*



F-stat (df)= 40.78 (2), η^2= 0.338, p<0.001*

Discussions

- ✓ **Intervention focus:** Impart skills, target children's cognition (concepts: knowledge), affective (emotions: attitude and self-efficacy), psychomotor domain (hands-on:practice) with parental involvement for support

- ✓ Favorable outcomes in children's psychosocial factors related to healthy meal preparation **(behavior determinants),** home food availability **(environment)** & dietary practices **(actual behaviors)**

Cooking programs among children aged 8-13 years [15-17]

Improved nutrition knowledge, cooking attitude, cooking self-efficacy, cooking skills, confidence to ask for healthy ingredients to be purchased for use at home, frequency of helping to prepare meals at home

Qualitative evaluation: Children had active roles in preparing meals at home, enjoyed hands-on meal preparation sessions, felt good, proud of their achievement, excited to taste the flavors of foods

A single meal preparation session can increase feelings of valence (pleasure) & dominance (control)

Potential drivers of behaviour change[18]

Experiential learning strategy: Reduce excessive energy intake, improve fruit, vegetable preference/consumption [19]

Features of culinary nutrition education

- **Explore foods via sensory means**
- **Create an enjoyable experience**
- **Solve problems, self-reflect, accomplish goals**
- **Sense of fulfilment**
- **Building positive feelings (peers)**
- **Improve home food environment**

Limitation & Future Direction

- **Self-reported** Recall & social desirability bias
- Prompts
- Confidentiality

- Overall eating pattern
- Inadequate: **Portion size, cooking method, nutrients**
- **Family meal practices & parental support**

- **Cooked dishes:** Protein foods
- Integration to syllabus
- **Longer follow-up period**/short refresher courses

- Malaysian children aged 10-11 years

Conclusion

- **Prospect of experiential culinary-focused programs** in improving behavior determinants, home food availability & food consumption→ Likely contributes to better food choices, skills & overall eating pattern

- Including minimal parental involvement in such programs is feasible and can support the change at home

- Similar programs deserve **implementation** in schools (stakeholders' support)

Our Work

Journal of Public Health: From Theory to Practice (2020) 28:155–161
https://doi.org/10.1007/s10389-019-01060-w

ORIGINAL ARTICLE

Development, validity and reliability of a questionnaire to measure children's psychosocial factors related to healthy meal preparation

Choon Ming Ng[1] · Hui Chin Koo[2] · Firdaus Mukhtar[3] · Roseline Wai Kuan Yap[4] · Pei Nee Chong[1] · Satvinder Kaur[1]

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Abstract
Aim Children's psychosocial factors related to healthy meal preparation are important for sustainable healthy dietary behaviour. At present, there is no valid and reliable tool to measure children's psychosocial factors related to healthy meal preparation. Hence, this study aimed to develop, validate and determine the reliability of a questionnaire designed to measure psychosocial factors related to healthy meal preparation among Malaysian children.
Subjects and methods This cross-sectional study included 250 children aged 9–11 years. The questionnaire developed was tested for face and content validity. Item analysis was conducted for the knowledge domain. Construct validity of attitude, practice and self-efficacy domains was assessed using exploratory factor analysis with principle axis factoring extraction and direct oblimin rotation. Cronbach's alpha coefficient and Kuder-Richardson Formula 20 assessed internal consistency. The intraclass correlation coefficient determined test-retest reliability.
Results All experts rated the questionnaire with a > 0.75 validity index. The knowledge domain had the optimal level of difficulty and could discriminate children with top and lower scores. Three-factor solutions emerged for the attitude domain and two-factor solutions emerged for the practice and self-efficacy domains, with appropriate factor loadings (> 0.40). Internal consistency ranged from 0.63–0.75 for the respective domains and an overall internal consistency of 0.82 for the whole questionnaire. Intraclass correlation coefficients ranged from 0.85–0.89 for the respective domains.
Conclusion Outcomes demonstrated that the questionnaire is a reliable and valid evaluation tool and can be adapted by countries to use in hands-on healthy meal preparation interventions to advocate healthy dietary behaviours among children.

Keywords Psychosocial factors · Healthy meal preparation · Reliability · Validity · Questionnaire

Received: 31 August 2019 | Revised: 11 June 2020 | Accepted: 11 June 2020
DOI: 10.1111/mcn.13054

SUPPLEMENT ARTICLE

Maternal & Child Nutrition WILEY

Influences of psychosocial factors and home food availability on healthy meal preparation

Choon Ming Ng[1] | Kaur Satvinder[1] | Hui Chin Koo[2] | Roseline Wai Kuan Yap[3] | Firdaus Mukhtar[4]

[1]Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia
[2]Faculty of Applied Sciences, Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
[3]School of Biosciences, Taylor's University, Subang Jaya, Malaysia
[4]Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia

Correspondence
Dr. Satvinder Kaur, Faculty of Applied Sciences, UCSI University, 1, Jalan Puncak Menara Gading, Taman Connaught, 56000 Kuala Lumpur, Malaysia.
Email: satvinderkaur@ucsiuniversity.edu.my

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Centre of Excellence for Research, Value Innovation and Entrepreneurship (CERVIE) UCSI University, Grant/Award Number: Proj-In-FAS-058

Abstract
The involvement of children in healthy meal preparation activities has emerged as a potential strategy to promote healthy eating behaviour among children. However, there is a lack of understanding of children's internal (psychosocial factors) and external factors (home food availability) that may support the practice of preparing healthy meals. This study aimed to determine children's psychosocial factors of healthy meal preparation within themselves and their external environment of home food availability as predictors for the practice of healthy meal preparation. Public schools (n = 8) from all three zones (Bangsar-Pudu, Keramat and Sentul) in Kuala Lumpur, Malaysia, were selected through stratified random sampling. Two hundred children aged 9–11 and their parents participated. Children's psychosocial factors towards healthy meal preparation and their home food availability were assessed through children and parents, respectively, using validated questionnaires. Majority of the schoolchildren (86.5%) had poor practice of healthy meal preparation. Increased attitude (r = 0.344, P < 0.001) and self-efficacy (r = 0.501, P < 0.001) of healthy meal preparation and the availability of fruits (r = 0.304, P < 0.001), vegetables (r = 0.243, P < 0.001) and healthful ready-to-eat foods (r = 0.227, P = 0.001) at home were positively correlated with the practice of preparing healthy meals. After adjusting for age, sex and monthly household income, increased

Int J Vitam Nutr Res. 2021 Sep;91(5-6):522-530. doi: 10.1024/0300-9831/a000655. Epub 2020 May 28.

Children's psychosocial factors of healthy meal preparation as predictors for nutritional status measures

Choon Ming Ng [1], Kaur Satvinder [1], Hui Chin Koo [2], Roseline Wai Kuan Yap [3], Firdaus Mukhtar [4]

Affiliations + expand

PMID: 32463351 DOI: 10.1024/0300-9831/a000655

Abstract

Involving school-age children in the preparation of healthy meals is shown to be associated with positive eating behavior. Yet, it remains unclear whether this can extend to their nutritional status. The present study aimed to determine the association of school-age children's psychosocial factors (knowledge, attitude, practice, self-efficacy) towards healthy meal preparation with their nutritional status (BMI-for-age, waist circumference, body fat percentage). Stratified random sampling was used to select primary schools (n = 8) in Kuala Lumpur, Malaysia. Two hundred school children aged between 9-11 years old were involved. Psychosocial factors towards healthy meal preparation were assessed using validated questionnaire. Anthropometry measures were determined using standard protocol. Almost half (46 %) of the school-age children were obese/overweight, 39 % were abdominally obese and 40 % were overfat. Approximately half had poor knowledge (49 %), poor practice (45 %), good attitude (56 %) and good self-efficacy (47 %) towards healthy meal preparation.

Our Work

SYSTEMATIC REVIEW PROTOCOL

Nutrition-related outcomes of children's involvement in healthy meal preparation: a scoping review protocol

Choon Ming Ng[1] · Satvinder Kaur[1] · Hui Chin Koo[2] · Firdaus Mukhtar[3]

[1]Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia, [2]Faculty of Applied Sciences, Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia, and [3]Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia

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ABSTRACT

Objective: This scoping review aims to describe the existing evidence of children's involvement in healthy meal preparation in terms of nutrition-related outcomes, and to highlight potential research directions.

Introduction: With the worldwide trend of unhealthy dietary habits among children, many researchers have explored the practice of healthy meal preparation as a health promotion habit. Hands-on healthy meal preparation seems to be promising among children, as it focuses on concrete experiences in creating positive attitude towards nutrition. However, a far-reaching understanding of the impact of healthy meal preparation on the wide-ranging nutrition-related outcomes among children is lacking.

Inclusion criteria: This scoping review will consider studies worldwide that focused on hands-on healthy meal preparation among children aged 5–12 years and the associated nutrition-related outcomes: psychosocial variables, actual nutrition-related behavior, and body composition.

Methods: Experimental studies, observational studies, reviews, and text and opinion papers related to the practice of healthy meal preparation among children in English language published from 2010–2019 will be retrieved from five electronic databases. Gray literature sources will also be searched. After screening of titles and abstracts, the full text of potentially relevant articles will be retrieved. Data extracted will be presented in tables alongside the necessary information. Any discrepancies that arise during data synthesis will be discussed among the research team until consensus is reached.

Keywords Children; cooking; healthy meal preparation; nutrition outcomes

JBI Evid Synth 2020; 18(3):534–542.

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DOI: 10.1111/jhn.12911

REVIEW - SYSTEMATIC REVIEW - META-ANALYSIS

BDA Journal of Human Nutrition and Dietetics

Involvement of children in hands-on meal preparation and the associated nutrition outcomes: A scoping review

Choon Ming Ng[1] | Satvinder Kaur[1] | Hui Chin Koo[2] | Firdaus Mukhtar[3]

[1]Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia

[2]Faculty of Applied Sciences, Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia

[3]Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), Serdang, Malaysia

Correspondence
Satvinder Kaur, Faculty of Applied Sciences, UCSI University, Jalan Menara Gading 1, Taman Connaught, 56000 Kuala Lumpur, Malaysia.
Email: satvinderkaur@ucsiuniversity.edu.my

Abstract

Background: Emerging research has explored hands-on meal preparation as a strategy to improve children's nutrition-related outcomes. This scoping review was conducted to describe the extent of studies on children's involvement in hands-on meal preparation and the related psychosocial outcomes, actual nutrition behaviour/food consumption and weight status.

Methods: Scoping review methodology was used to select relevant studies, as well as extract and collate the data. Four databases (PubMed, Google Scholar, Science Direct and Cochrane Database of Systematic Reviews) were searched from the earliest available time up to December 2020. Observational studies, experimental studies and reviews that were conducted among children aged 5–12 years old and published from 2010 to 2020 were retrieved. Studies extracted involved children in hands-on healthy meal preparation activities and explored the associated nutrition outcomes.

Results: In total, 28 studies (5 observational studies, 21 experimental studies, 2 reviews) were included in the final review. Studies conducted demonstrated improvement in children's psychosocial outcomes and actual nutrition behaviour/food consumption after participating in hands-on meal preparation activities, despite differences in methodology, programme content and settings (countries/cultural origins). Limited studies assessed children's nutrients intake and weight status.

Conclusions: The current review suggests that hands-on meal preparation com

Our Work

Research Article

Culinary Nutrition Education Improves Home Food Availability and Psychosocial Factors Related to Healthy Meal Preparation Among Children

Choon Ming Ng, PhD[1]; Satvinder Kaur, PhD[1]; Hui Chin Koo, PhD[2]; Firdaus Mukhtar, PhD[3]; Hip Seng Yim, PhD[1]

ABSTRACT

Objective: To evaluate the effectiveness of a culinary nutrition education intervention on children's home food availability and psychosocial factors related to healthy meal preparation.
Design: Randomized-controlled trial.
Setting: Schools in Kuala Lumpur, Malaysia.
Participants: Eighty-three school children aged 10−11 years and their parents.
Intervention: Twelve weeks of culinary nutrition education with 5 hands-on healthy meal preparation modules and a module with parents on home food availability (conducted every 2 weeks).
Main Outcome Measures: Psychosocial factors (knowledge, attitude, practice, and self-efficacy) related to healthy meal preparation and home food availability (fruits, vegetables, healthful foods, and less healthful foods) assessed via children and parents, respectively, using validated questionnaires at baseline, postintervention, and 3-month follow-up.
Analysis: Repeated measures ANOVA.
Results: Intervention group had a higher ($P < 0.001$) mean knowledge score (mean difference, 1.2), attitude (mean difference, 2.6), practice (mean difference, 4.4) and self-efficacy (mean difference, 3.9) of healthy meal preparation as compared with control group across 3-time points. Improvements were seen in the availability of fruits (mean difference, 3.0; $P < 0.001$), vegetables (mean difference, 2.4; $P < 0.001$), healthful foods (mean difference, 1.5; $P < 0.001$) and less healthful foods (mean difference, −0.9; $P = 0.001$), favoring the intervention group.
Conclusion and Implications: Culinary nutrition education had positive impact on children's psychosocial factors and home food availability, demonstrating the potential to improve children's nutrition.
Key Words: cooking intervention, parent-child pairs, psychosocial factors, home food availability, self-efficacy (*J Nutr Educ Behav.* 2022;54:100−108.)

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2023 Best Article Finalist

Culinary Nutrition Education Improves Home Food Availability and Psychosocial Factors Related to Healthy Meal Preparation Among Children

Choon Ming Ng, PhD; Satvinder Kaur, PhD; Hui Chin Koo, PhD; Firdaus Mukhtar, PhD; Hip Seng Yim, PhD

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Experiential healthy meal preparation: A randomized-controlled trial to improve food group consumption and weight status among children

Choon Ming Ng[a,b], Satvinder Kaur[a,*], Hui Chin Koo[c], Firdaus Mukhtar[d], Hip Seng Yim[a]

[a] *UCSI University, Faculty of Applied Sciences, 1 Jalan Menara Gading, Taman Connaught, 56000, Kuala Lumpur, Malaysia*
[b] *Monash University Malaysia, School of Pharmacy, South Lagoon Road, 47500, Bandar Sunway, Selangor, Malaysia*
[c] *Tunku Abdul Rahman University College, Faculty of Applied Sciences, Jalan Genting Kelang, 53300, Kuala Lumpur, Malaysia*
[d] *Universiti Putra Malaysia, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400, Serdang, Selangor, Malaysia*

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ABSTRACT

Background: Unhealthy eating practices and the continual rise in childhood obesity calls for an effective strategy to promote healthy eating among school-aged children.
Aim: The study objective was to determine the change in children's food group consumption and weight status (BMI-for-age z-score, body fat percentage, waist circumference) after participating in a school-based experiential healthy meal preparation intervention.
Methods: In this two-arm randomized-controlled trial, 2 schools were randomly assigned to intervention or control group. In total, 86 Malaysian schoolchildren aged 10–11 years participated. The intervention group underwent six 60-min healthy meal preparation modules conducted biweekly. The frequency of food group consumption was self-reported, while weight status was measured.
Results: Intervention group consumed whole grains (+1.36 vs 0.00 times/day), vegetables (+2.35 vs −0.29 times/day), fruits (+1.64 vs −0.14 times/day) and legumes (+1.42 vs + 0.13 times/day) more frequently than the control group after the program ($p < 0.001$). There were significant reductions in unhealthy foods consumption (refined grains: -1.57 vs + 0.36, processed foods: -2.15 vs + 0.36, sweetened beverages: -1.13 vs + 0.58 times/day; $p < 0.001$) between intervention and control groups. No significant difference was found in children's weight status between groups after the intervention.
Conclusion: Findings suggested that an experiential healthy meal preparation program can improve diet and should be explored further as a strategy to control the rise of obesity among children.

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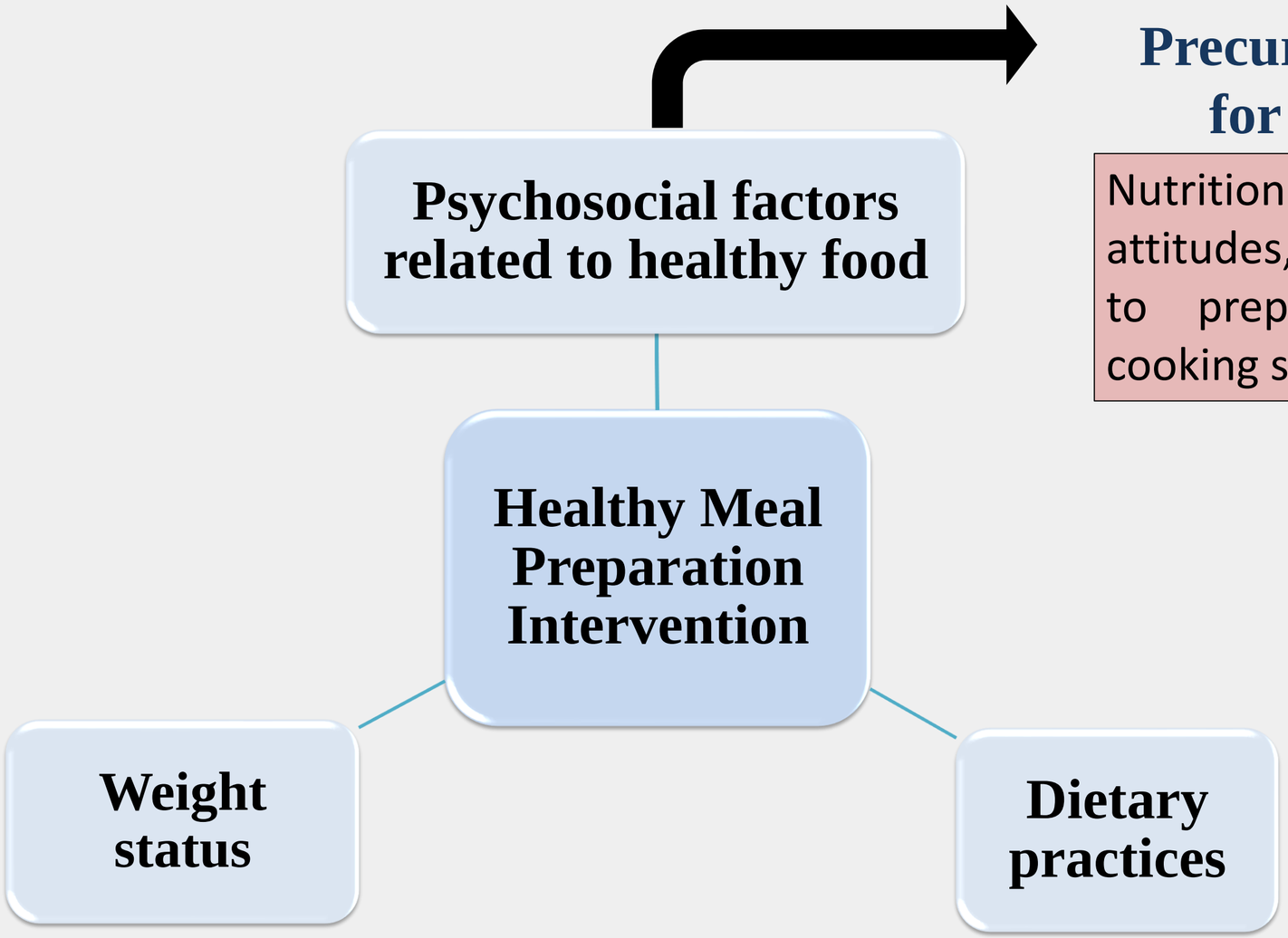
Assoc. Prof. Dr. Satvinder Kaur*
satvinderkaur@ucsiuniversity.edu.my

Thank You.

Content

1. Introduction: Challenges in promotion of healthy eating
2. The potential of culinary nutrition education
3. ‘Kids in Kitchen’ Intervention in Malaysia
4. Findings & Discussions
5. Recommendations & Conclusion

Current Evidence: Systematic Reviews [11-12]



Precursors & motivations for behavior change

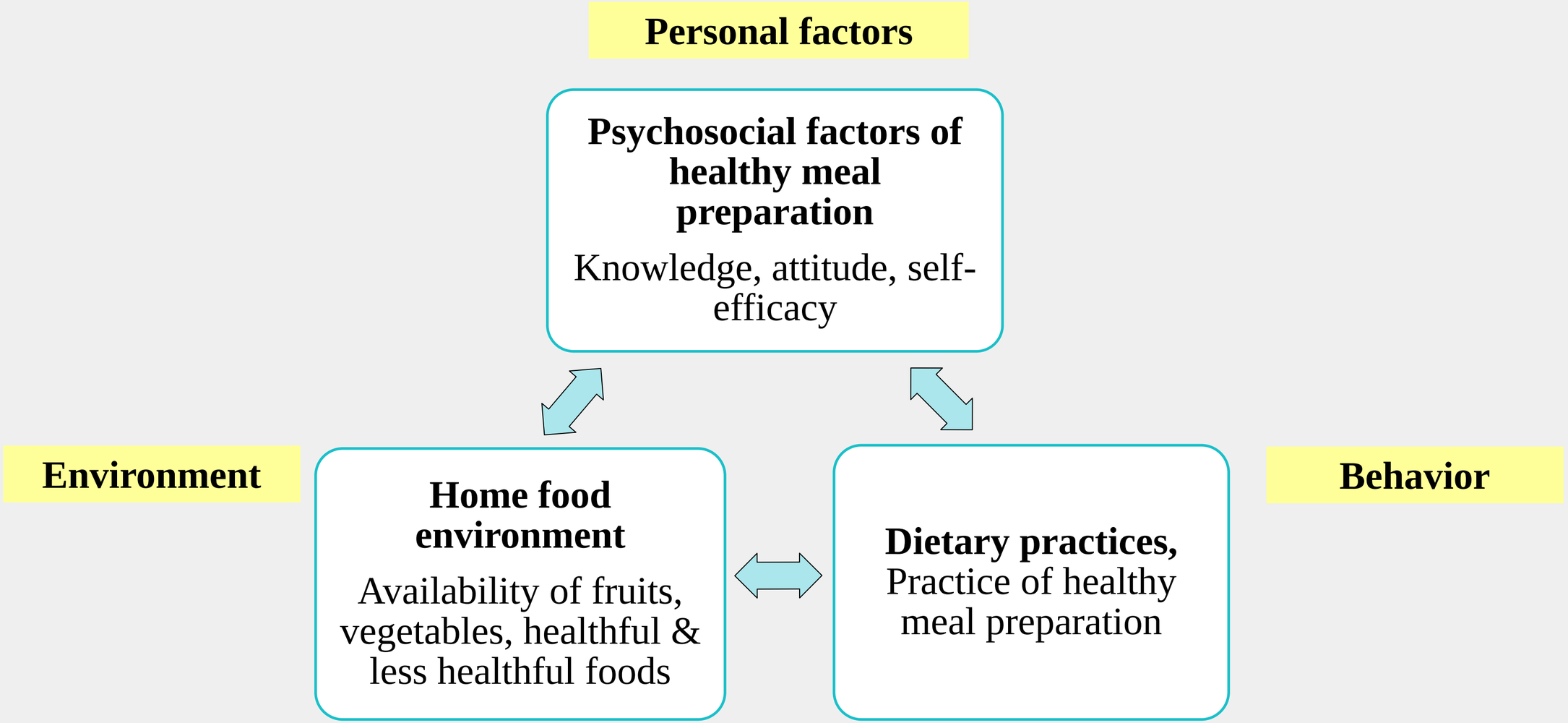
Nutrition knowledge, cooking attitudes, the practice of helping to prepare meals at home, cooking self-efficacy & skills

Moving Forward

Programs that teach nutrition thro healthy meal preparation are recognized as policy actions to be integrated [13]

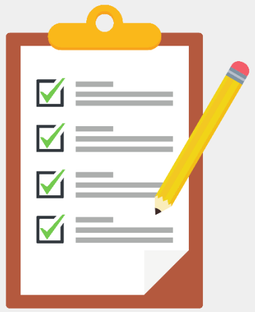
- ✓ **Interventions to be further evaluated: Physical environment**
- ✓ **Sustainability of outcomes: Beyond pre & post** [14]
- ✓ **Population in developing nations** [15]

Social Cognitive Theory's reciprocal causation [16]



Sociodemographic & Weight Status

Self-reported Questionnaire



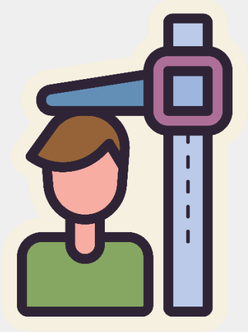
Age

Sex

Parental education

Monthly household income

Height



Stadiometer, Germany

Body fat, BMI-for-age, Waist circumference

- Tanita Body Composition Analyzer, Japan
- BMI-for-age z-score (WHO AnthroPlus software & growth reference chart) [25]
- Waist: Non-stretchable measuring tape

Psychosocial Factors Related to Healthy Meal Preparation

Validated Guided, Close-Ended Questionnaire for Children [19]

- ✓ **Knowledge** (nutrition knowledge, food groups & nutrients, cooking methods, healthier meal alternatives/strategies)
- ✓ **Attitude**/perceptions
- ✓ **Self-efficacy**/confidence to perform meal preparation tasks. 5-point Likert scale format illustrated using emoticons
- ✓ **Practice**/frequency of participating in meal preparation tasks: Never throughout the year, rarely (1−12 times/y), sometimes (2−4 times/mo), often (2−4 d/wk), always (5−7 d/wk)

Home Food Availability

Adapted Form For Parents [20-22], **Cronbach α=0.72**

✓ **Availability of food at home, past 1 week (Yes, foods were available; No)**

Dietary Practices

Adapted guided form [23]

→ Malaysian Dietary Guidelines (MDG) for Children & Adolescents [24]

- ✓ **Meals consumption/week:** Breakfast, morning snack, lunch, afternoon snack, dinner, supper
- ✓ **Food group consumption at every meal**
- ✓ Whole grains, vegetables, fruits, meat/poultry, legumes, fish dairy, refined grains, processed foods, sweetened beverages
- ✓ Visual aids (pics/food models)
- ✓ Frequency of food group consumption/day

Discussions

- Culinary nutrition program (Spain)[31] → beneficial change in **food phobias, knowledge, beliefs & diet quality** (adherence to Mediterranean diet, post-intervention)

- Similar to culinary interventions conducted in other countries & populations [28-30], likely the **intervention features (experiential active learning/sensory experience) provided concrete experiences→ positive relationship with healthy food which promotes the food learning process**

- Influence on **behavioral determinants, (cognitive-related factors) → behavioral change related to dietary choices**

Discussions

- Concept of hands-on learning involving food[32] → **Drives the process of behavior change:**

✓ Initial introduction of various healthy foods

✓ Exploration (Direct contact with healthy food to overcome dislikes, develop interest, preferences through taste, smell, touch, hearing, visual exposure)

✓ Skill building

✓ Excitement, liking, acceptance/success

✓ Reinforced with peer support/parents/family engagement

Improvement in Personal Factors, Environment, Behavior: SCT

- **Good attitude & self-efficacy** were related to increased use of basic ingredients, healthier food selection & willingness to experiment with new foods[33-35]
- **Knowledge** potentially influences food skill (grocery shopping, food selection)[36]
- **Preparing healthy meals (practice)** was associated with greater availability of healthy ingredients at home[37]
- Intervention: Empowered to request healthy foods, improved confidence, skill, interest for meal preparation (learn new skill, taste food, select healthy ingredient rather than relying on parent)[38]
- Advantageous w parental involvement: **Autonomy to nurture positive dietary practice & gatekeeper to the home food environment**

Symposium session 'Nutrition Education: Practice from a Global Perspective’

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