Increasing Vegetable Intake in Children

Katelyn Knapp – Dietetic Intern
December 7, 2018
Figure 1: Husband and Step Daughter (Knapp 2018)
Figure 2: Live It Program (Knapp 2018)
What is the leading source of vegetables for children accounting for 28% of intake?
Figure 3: French Fries (Jamie Geller 2001)
Did You Know?

• Diets rich in vegetables protect against chronic conditions (CVD/cancer)

• 21.4% of children consume 5 + servings of fruits or vegetables daily

• Eating habits established in childhood track into adulthood

Figure 4: Girl Eating Cake (Getty 2015)


How Can We Fix This?

• Curriculum
• Garden program
• Repeated exposure
• Reward
• Pairing with desirable food

Figure 5: Kids Gardening (158Main 2014)
STUDY 1
A Garden Based Pilot Intervention to Increase Vegetable and Fruit Intake in Preschoolers

Namenek Brouwer RJ, Benjamin Neelon SE. | April 2013
BMC Public Health
A Garden Based Pilot Intervention to Increase Vegetable and Fruit Intake in Preschoolers

Purpose

- To test if health curriculum paired with a garden would help preschoolers consume more fruits and vegetables.

A Randomized Controlled Trial

Positive Quality Rating

Namenek Brouwer RJ, Benjamin Neelon SE. | April 2013
BMC Public Health
A Garden Based Pilot Intervention to Increase Vegetable and Fruit Intake in Preschoolers

Participants

- Four licensed childcare centers located in North Carolina
- Providing all foods/beverages
- No abuse/neglect
- Ages 3-5 (at least 3)

Nameneck Brouwer RJ, Benjamin Neelon SE. | April 2013

BMC Public Health
Figure 6: Watch me Grow (GPB 2013)
A Garden Based Pilot Intervention to Increase Vegetable and Fruit Intake in Preschoolers

Intervention

- Centers were randomized with 2 in the intervention group and 2 in control
- 3 students from each center pre/post consumption
- Monthly curriculum – Watch me Grow
- Health educators visited the school
- Garden (lettuce, strawberries, spinach, and broccoli)

Figure 7: Broccoli Book (Amazon 2014)
Vegetable Consumption

A Garden Based Pilot Intervention to Increase Vegetable and Fruit Intake in Preschoolers

Namenek Brouwer RJ, Benjamin Neelon SE.  | April 2013 | BMC Public Health
A Garden Based Pilot Intervention to Increase Vegetable and Fruit Intake in Preschoolers

**Strengths**

- Paired education with gardening (other studies look at one or the other)
- Teachers were educated by an outside source

**Weaknesses**

- Small sample size (no statistical significance)
- Not clear which activities had the greatest impact
- Expensive

Namerek Brouwer RJ, Benjamin Neelon SE. | April 2013
BMC Public Health
A Garden Based Pilot Intervention to Increase Vegetable and Fruit Intake in Preschoolers

Conclusion

Drawing on the conclusions from study 1, gardening interventions paired with classroom education increases vegetable intake in preschoolers but decreases fruit intake.

I recommend for private schools/schools with outside funding

Namerek Brouwer RJ, Benjamin Neelon SE. | April 2013

BMC Public Health
STUDY 2
Parent-Administered Exposure to Increase Children’s Vegetable Acceptance

Fildes A, van Jaarsveld CHM, Wardle J, Cooke L. | June 2014
Journal of the Academy of Nutrition and Dietetics
Parent-Administered Exposure to Increase Children’s Vegetable Acceptance

Purpose

• Test the effectiveness of mailed instructions on taste exposure as a means of increasing vegetable acceptance in pre-school aged children.

A Randomized Control Study
Positive Quality Rating

Fildes A, van Jaarsveld CHM, Wardle J, Cooke L. | June 2014
Journal of the Academy of Nutrition and Dietetics
Parent-Administered Exposure to Increase Children’s Vegetable Acceptance

Participants

• Families with 3-4 year old children from the Gemini study (cohort of England and Wales)
• 2,321 were sent information and 1,006 expressed interest in taking part
• 472 outcome data sheets were returned (n=472)
• Randomized to mail intervention group or control group

Fildes A, van Jaarsveld CHM, Wardle J, Cooke L. | June 2014
Journal of the Academy of Nutrition and Dietetics
Parent-Administered Exposure to Increase Children’s Vegetable Acceptance

Intervention

• Offering child 14 different tastes of target food on 14 different days
• Reward sticker if the child complied (tasting game)
• The mailed packet contained
  – Instructions
  – Stickers
  – Progress charts
• 6 equal sized pieces (do not encourage and respond neutrally if refused)
*P < .001*
**Parent-Administered Exposure to Increase Children’s Vegetable Acceptance**

Parent-Administered Exposure to Increase Children’s Vegetable Acceptance

Strengths

• Parents can easily be taught these techniques
• Inexpensive

Weaknesses

• Parents were not blinded
• Conditions were not very strict

Fildes A, van Jaarsveld CHM, Wardle J, Cooke L. | June 2014
Journal of the Academy of Nutrition and Dietetics
Parent-Administered Exposure to Increase Children’s Vegetable Acceptance

Conclusion

Drawing on the conclusions of study 2, mailed instructions for parent-administered repeated exposure is effective for increasing vegetable acceptance in children.
You Were a Test Subject!

Figure 8: Celery (NBC 2009)

Figure 9: Carrots (ETM, n.d.)
STUDY 3

Increasing Vegetable Intake in Mexican-American Youth

Johnston CA, Palcic JL, Tyler C, Stansberry S, Reeves RS, Foreyt JP. | May 2011

Journal of the American Dietetic Association
Increasing Vegetable Intake in Mexican-American Youth

Purpose

- To test if pairing vegetables with a desirable food (peanut butter) will increase vegetable consumption in children.

A Randomized Control Trial

Positive Quality Rating

Johnston CA, Palcic JL, Tyler C, Stansberry S, Reeves RS, Foreyt JP. | May 2011

Journal of the American Dietetic Association
Increasing Vegetable Intake in Mexican-American Youth

Participants

- 78 Mexican-American middle school-aged children
- Charter school in Houston, TX
- 11-13 years old
- Children of any weight

Johnston CA, Palcic JL, Tyler C, Stansberry S, Reeves RS, Foreyt JP. | May 2011
Journal of the American Dietetic Association
Increasing Vegetable Intake in Mexican-American Youth

Intervention

• Students were randomized into two classrooms (intervention and control)
• Went on during weight loss intervention
• Both classes were presented with 3 varieties of vegetables (1 oz serving bags)
• Carrots, broccoli, celery
• Weekly for four months
• Peanut butter (3/4 oz packet)
Paired Control

Initial Intake (oz) Final Intake (oz)

Ounces

0 0.5 1 1.5 2

Change in Vegetable Intake

Paired Control

P < .001

Increasing Vegetable Intake in Mexican-American Youth
Increasing Vegetable Intake in Mexican-American Youth

Strengths

• Affordable intervention
• Realistic intervention (easy to be administered by parents)

Weaknesses

• No follow up to assess vegetable consumption w/o peanut butter
• Self-reported data at baseline
Increasing Vegetable Intake in Mexican-American Youth

Conclusion

Drawing on the conclusions of study 3, pairing vegetables with a desirable food, such as peanut butter, increases vegetable consumption and variety in children.
Relevance

- Foodservice
- Community Nutrition
- MNT
- Adults?

Figure 10: School Lunch (KIWI, n.d.)

Figure 2: Live It Program (Knapp 2018)
Take Home Message

• Most children do not consume enough fruits and vegetables in a day.
• A diet rich in vegetables can protect against chronic conditions such as CVD.
• Studies show that pairing vegetables with a nutrient rich food (peanut butter) can increase consumption.
• Studies show that repeated exposure and rewards can increase consumption.
• Studies show that education with gardening activities can increase consumption.
Resources


Resources


THANK YOU
Katelyn Knapp
*Increasing Vegetable Intake in Children*

Website to download:

https://uwgbrsearchre
views.weebly.com/