Lessons learned: development and evaluation of an interactive computer food safety education program for WIC Program clients, Miami, Florida

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Foodborne illness background

- Consumer food handling errors responsible for most sporadic cases of foodborne illness
- Estimated incidence of foodborne illnesses*
  - Poor personal hygiene 9.3 million cases
  - Cross contamination/inadequate cooking 3.5 million cases
  - Not chilling adequately 0.5 million cases
  - Consuming foods from unsafe sources 10,000 cases
- Pregnant women and very young at risk of severe outcomes from foodborne infections

*Medeiros LC, et al *J Nutr Educ.* 2001;33:108–113

Food safety education and WIC Program

- USDA Special Supplemental Program for Women, Infants, and Children (WIC) provides nutritional education and food supplementation to > 8 million women, infants, and young children monthly*
- Food safety knowledge among WIC participants suboptimal
- Most WIC programs not staffed at levels to provide food safety education

*USDA, http://www.fns.usda.gov/pd/36WIC_Monthly.htm

Interactive multimedia (IMM)

- Incorporates audio, text, video, animation, and graphics to convey educational content
- Can include interactive tools (e.g. quizzes and games)
- Theoretical advantages
  - Active participation
  - Accessible if low literacy skills
  - Consistent, correct information
  - Immediate feedback
  - Minimal costs after equipment purchased
  - No additional staff
- No controlled studies have evaluated food safety education using IMM

Study objective

- Determine if IMM is more effective than pamphlets in improving self-reported food safety practices of WIC clients

Methods: steps in development of IMM

- Focus groups with clinic clients and interviews with clinic nutritionists
- Survey of WIC clients
- Validation of food safety practices questionnaire
- Curriculum content development
- Software production

Methods: curriculum design

- Content
  - Partnership for Food Safety Education's Fight BAC!® campaign constructs of
    - "Clean"
    - "Separate"
    - "Cook"
    - "Chill"
  - Foods to avoid during pregnancy
  - How to safely prepare and store formula and baby food
- Based on health belief model

Methods: IMM design

- IMM product included:
  - Background information about food safety
  - Food safety messages as described above
  - Quiz questions after each module
- Narration throughout program
- Answers given immediately after questions
- Designed for largest racial/ethnic group at study site: African Americans
- Designed for stand-alone kiosk

Lesson 4: Food Safety for Infants & Toddlers

Exit

Chill: Store Bottles & Food Properly

0 50 100

Play ▶

Volume

Dictionary | Show Me More | Check Up | Let Me Try

Now that you have learned about food safety for infants and toddlers, let's see what you know. Select Check Up now.

Lesson 5: Food Safety During Pregnancy

Exit

Watch What You Eat

SAFE EGGS:

Any eggs with a firm yolk and white, such as hard boiled eggs or scrambled eggs that are not runny

0 50 100

Pause

222 Certificate Logout Menu Next

Volume

Dictionary | Show Me More | Check Up | Let Me Try

Now that you have learned about food safety during pregnancy, let's see what you know. Select Check Up now.

Methods: evaluation

- Design: randomized controlled trial
- 2 groups: IMM and pamphlet
- Setting: WIC clinic serves 6000 clients/month, majority African American
- Subjects: 400 pregnant WIC clients or female caregivers (usually mothers) of WIC clients, ≥18 years of age, and able to speak and read English

Methods: RCT

- Measurement tools:
  - Pre-intervention food handling questionnaire
  - Post-intervention questionnaire (>2 months after intervention)
  - Satisfaction questionnaire to IMM group
- Outcome: pre- to post-intervention change in food handling scores
- Statistical analyses:
  - Mean pre- and post-intervention food safety score determined for each participant
  - Two-group repeated measures analysis of variance

Results: enrollment and randomization

- 394 clients enrolled and randomized

  195 (49.5%) to intervention group

  199 (50.5%) to control group

- No statistically significant differences in demographic characteristics or baseline food handling scores

Results: experience with IMM

- Average time spent: 35 minutes
- Agree or strongly agree with statements
  - 93.9% Enjoyed using kiosk
  - 96.7% Easy to use kiosk
  - 95.0% Learned a lot from program
  - 86.6% Prefer kiosk to reading pamphlets
  - 92.1% Would like to learn about other health and nutrition topics this way
- Those with no education beyond high school more likely to agree or strongly agree with statements
  - Enjoyed using kiosk
  - Prefer kiosk to pamphlets
  - Would like to learn about other topics using kiosk
- No other demographic variable associated with satisfaction

Results: follow-up

- 255 (64.7%) completed follow-up questionnaire
- Of those without follow-up
  - 57% were reached by phone but did not come to clinic
  - 43% contact information no longer valid
- No differences in demographic characteristics or baseline total food handling scores between those with or without follow-up

Results: food handling practices changes overall

- Mean food handling score increased for IMM and pamphlet groups significantly but no group effect
- When considering model with age, larger improvement in score in IMM group (P=0.005) found, but size of group effect small (partial η^2 = 0.033)
- Women aged ≥35 years in IMM group had largest increase in score.
- No other demographic factor associated with improvement

Results: food handling practices changes by construct

- Largest increase in scores over time was for "thermometer use" items, but no group effect
- For "cooking" items statistically significant but trivial (<3% of variance) pre-post and group effects
- For "clean" items statistically significant but trivial increase in scores

Results: logistical issues

- Safety issues
  - Vents
  - Ear phones
- Noise
- Comfort
- Avoid paper
- Need to be able to bookmark place on program if training interrupted

Main findings

- IMM very well received; > 90% of women who received education by IMM reporting enjoying it
- Larger improvement in total scores in IMM group than pamphlet group when age in model but difference small
- Women in oldest age group seemed to benefit most from IMM

Study limitations

- No validation of self-reported practices
- About 35% of participants did not complete follow-up questionnaire
- Long follow-up times
- Study conducted in one clinic which served WIC clients living in urban area

Recommendations

- Test in other WIC populations
- Effective yet initially costly
  - Cost would decrease as more programs available
  - Cost decrease as more people use program

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