Research Brief

Discussion Map and Cooking Classes: Testing the Effectiveness of Teaching Food Safety to Immigrants and Refugees

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ABSTRACT

Objective: To evaluate the effectiveness of a food safety map as an educational method with English language learners.

Methods: English language learner community members (n = 73) were assigned randomly to participate in 1 of 3 experimental conditions: food safety map, cooking class, and control. Participants in the food safety map and cooking class conditions completed a pre-education demographic and cooking history questionnaire, a post-education knowledge and intention questionnaire, and a 2-week post-cooking and food safety habits assessment. Participants in the control group received no educational training but completed the pre- and 2-week post-education assessments.

Results: The cooking class and the map class were both effective in increasing food safety knowledge. Specifically, by comparing with the control group, they significantly increased participants’ knowledge of safely cooking large meat ($\chi^2 [df = 2, n = 66] = 40.87; P < .001; V^* = .79$) and correctly refrigerating cooked food ($\chi^2 [df = 2, n = 73] = 24.87, P < .001; V^* = .58$). The two class types generated similar positive educational effects on boosting food safety behavioral intention (measured right after the class). The data collected 2 weeks after the classes suggested that individuals who took the classes followed the suggested food behaviors more closely than those in the control group ($P < .01$).

Conclusions and Implications: The food safety map is simple to use and prepare, beneficial for oral and visual learners, and inexpensive. Compared with a food safety cooking class, the map produces similar learning and behavioral outcomes.

Key Words: food safety education, food safety, English language learner, conversation map (J Nutr Educ Behav. 2014;46:547-553.)

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INTRODUCTION

Immigrant, refugee, and English language learners are special populations to consider regarding food safety education because some came from extreme hardship to a safer situation. Food pattern changes probably occur in this transition as well. Therefore, food safety interventions are needed that include culturally appropriate messages to help them maintain healthier lifestyles and learn new food preparation techniques. Understanding the learning styles and preferences of different migrating populations will allow food safety principles to be translated into effective community-based food safety education programs.

Different cultural groups do not share the same priorities or perspectives; thus, cultural groups respond differently to food safety communication based on their perceptions and worldviews. Because much of the world’s population learns new things and cultural ways in a non-written format, dialogue is recommended as a way to foster understanding about differences between cultures and exchanges of information. Dialogue is defined as the interaction between people that develops shared understanding, leading to feelings of trust, agreement, and creative problem solving. Communicating through dialogue empowers community members by supporting attitudes of openness, empathy, and equality that can enrich a broad-based community health improvement process.

Kreps et al1 suggested that a major challenge facing community health education is making relevant information accessible to various cultural groups in society. Accurate perceptions of the similarities and differences between the world of food safety science and the context of the ethnic group affect the ability to communicate effectively with others. Therefore, food safety education could be enhanced by adapting

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to the world of cultural groups by incorporating dialogue.\textsuperscript{5}

Realizing that some refugees and immigrants prefer to converse about important topics, the authors developed a food safety discussion map (Figure). This discussion map was modeled after conversation maps used with diabetes education, which are self-discovery learning tools that engage audiences through dialogue.\textsuperscript{6} The food safety discussion map facilitates dialogue with a game-type board; topic cards are used to bring forth information from various parts of the map. Facilitators have a script of suggested talking points. Participants share their experiences and relate the information to their lives. The resulting discussion unveils misconceptions and myths related to food safety, allowing the facilitator to make corrections and take advantage of teaching points. Through this study, the authors hoped to learn whether the food safety discussion map worked the same, better, or worse in terms of participant knowledge gain, intention to apply new skills, and actual application of skills compared with a standard cooking class that incorporates food safety concepts. The food safety discussion map teaching method could potentially take less time and require fewer resources than the cooking class.

The primary goals of this study were to (1) evaluate the effectiveness of a food safety discussion map as an educational method to increase knowledge and promote positive changes in food safety behaviors among English language learners and (2) identify the potential for this educational method as an acceptable alternative to traditional cooking classes in achieving the same educational outcomes.

**METHODS**

A 1 by 3 between-subject field experimental design guided data collection. Refugee and immigrant participants were recruited through word of mouth and subsequent phone calls to potentially interested community members; international students were recruited through either listserv e-mails or word of mouth. Inclusion criteria included: male or female adults, \( \geq 18 \) years of age, who were primary food preparers in their homes. Individuals who agreed to participate were randomly assigned to 1 of 3 different conditions (cooking class, food safety discussion map class, or no education). The map and cooking class groups were facilitated or led by a Family and Consumer Science Extension agent who was trained in food safety concepts. All procedures were approved by the North Dakota State University’s Institutional Review Board.

**Procedures**

In the food safety discussion map group, principles of food safety were introduced and instructed through participants’ engagement in a discussion map in a single 2-hour session. When using the map, participants gathered around a game-type board and discussed food safety topics. Topic cards were used to illustrate information from various parts of the map. Hands-on activities and visual demonstrations also were included in the food safety discussion map protocol. The food safety discussion map was pre-tested by faculty, staff, and county Extension agents during the development stage. Verbal feedback was collected from the various groups and the suggested modifications were integrated into the educational tool. The researchers tested the resulting revised map with international college students, collected verbal feedback, and finalized the map.

Participants in the cooking class group attended 2 sessions. Using a peer-reviewed script and structured activities, Extension staff provided cooking classes that stressed basic cooking skills and integrated food safety concepts covered in the map activity.\textsuperscript{7} Each cooking class lasted approximately 2 hours.

All map and cooking classes had 5–8 participants. Upon completion, participants in the map activity and cooking classes received a food safety kit consisting of a food thermometer, a picture-based refrigerator magnet with recommended temperatures, a cutting board, a vegetable brush, a refrigerator thermometer, a “wash your hands” mirror cling, and a $25 gift card for groceries. Control group participants only received a gift card.

Participants in the food safety discussion map class and cooking class groups completed a short paper-and-pencil questionnaire regarding basic demographic information and cooking history (ie, who cooks for the family, whether they cook for children, where they learned their cooking skills) before the class started. Immediately after the classes, participants completed a paper-and-pencil questionnaire that assessed knowledge gained and intention to change food safety behaviors.
Study was specially developed and then established measures implemented in studies of TPB. Measures of knowledge, behavioral intention, and actual behaviors, which were provided for each knowledge question asked, then asked about intention to incorporate the knowledge, and finally included an accompanying behavioral question. (For this study, the control group did not receive the intention questions.) For example, 1 knowledge question asked, “When you cook a large piece of meat (without cutting it), how do you know it is safe to eat?” The behavioral intention statement was “I intend to use a food thermometer when I cook a large piece of meat to make sure it’s safe to eat,” and the behavioral statement was “I use a food thermometer when I cook a large piece of meat to know it’s safe to eat.” Knowledge question answers were multiple choice. Behavioral question answers were a 5-point scale from “never” to “always” for performing a specific behavior.

Behavioral intention was measured by asking about the likelihood that individuals will perform recommended food safety behaviors in the near future. The wording used to measure behavioral intention closely followed the established measures implemented in studies of TPB. Measured food safety behaviors include washing hands before food preparation and after raw meat preparation; cleaning cutting boards after meat preparation; defrosting meat using a refrigerator, cold running water, or microwave; using a food thermometer; and refrigerating cooked food. The behavioral intention questions were asked immediately after the classes and were measured with a 5-point Likert scale (1 = very unlikely; 5 = very likely). Because the control group received no food safety classes, behavioral intention questions were not measured in the control group.

Individuals’ actual behaviors were assessed 2 weeks after participants completed the educational classes. The behavioral questions were answered by all 3 experimental groups including the control group. This set of questions was measured with a 5-point Likert scale (1 = never; 5 = always).

Besides changing behaviors, another goal of the educational classes was to improve individuals’ knowledge about food safety. Participants answered multiple choice questions in which they were asked to select the correct and recommended behaviors for thawing meat, cooking meat, cleaning cutting boards, refrigerating food, and washing hands before and after food preparation, respectively. The knowledge questions were asked immediately after the educational programs were offered. Four answers were provided for each knowledge question and only 1 was correct. Responses were coded as “incorrect” and “correct” after they were collected.

Due to the uniqueness of the intervention population, surveys were specially created because validated surveys addressing the study’s learning and behavioral aims were not found. Also, each knowledge or behavioral model. However, the TPB offered a theoretical foundation for the inclusion of measures of knowledge, behavioral intention, and actual behaviors, which are important indicators of health outcomes.

The questionnaire series used in this study was specially developed and then audience tested in a much larger (unpublished) formative evaluation study designed to understand the knowledge and behaviors associated with food safety in immigrants and refugees. In the questionnaire series, each concept of food safety started with a knowledge question, then asked about intention to incorporate the knowledge, and finally included an accompanying behavioral question. (For this study, the control group did not receive the intention questions.) For example, 1 knowledge question asked, “When you cook a large piece of meat (without cutting it), how do you know it is safe to eat?” The behavioral intention statement was “I intend to use a food thermometer when I cook a large piece of meat to make sure it’s safe to eat,” and the behavioral statement was “I use a food thermometer when I cook a large piece of meat to know it’s safe to eat.” Knowledge question answers were multiple choice. Behavioral question answers were a 5-point scale from “never” to “always” for performing a specific behavior.

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**Table 1. Percentage of Refugees and Immigrants Reporting Correct Food Safety Knowledge Answers (Post-Education), by Teaching Condition**

<table>
<thead>
<tr>
<th>Food Safety Knowledge Questions</th>
<th>Cooking Class</th>
<th>Map Class</th>
<th>Control Group</th>
<th>(\chi^2)</th>
<th>(P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What should you do with your hands before you prepare food?</td>
<td>100% (n = 21)</td>
<td>82% (n = 27)</td>
<td>80% (n = 25)</td>
<td>4.7</td>
<td>.10</td>
</tr>
<tr>
<td>What should you do with your hands after you touch raw meat, chicken, or fish?</td>
<td>100% (n = 21)</td>
<td>82% (n = 27)</td>
<td>82% (n = 25)</td>
<td>4.4</td>
<td>.11</td>
</tr>
<tr>
<td>What should you do with the cutting board after you have cut raw meat, chicken, or fish?</td>
<td>37% (n = 21)</td>
<td>46% (n = 27)</td>
<td>19% (n = 25)</td>
<td>3.8</td>
<td>.15</td>
</tr>
<tr>
<td>Where should you unfreeze frozen meat?</td>
<td>20% (n = 21)</td>
<td>19% (n = 27)</td>
<td>4% (n = 25)</td>
<td>3.2</td>
<td>.21</td>
</tr>
<tr>
<td>When you cook a large piece of meat (without cutting it), how do you know it is safe to eat?</td>
<td>100% (n = 21)</td>
<td>100% (n = 27)</td>
<td>30% (n = 25)</td>
<td>40.9 &lt; .001</td>
<td></td>
</tr>
<tr>
<td>How soon should cooked meat, soup, or rice be put in the refrigerator after it is cooked?</td>
<td>100% (n = 21)</td>
<td>100% (n = 27)</td>
<td>56% (n = 25)</td>
<td>24.9 &lt; .001</td>
<td></td>
</tr>
</tbody>
</table>

Note: Food safety knowledge was coded as correct and incorrect answers. A chi-square test was conducted for each knowledge question across teaching conditions.
item was measured with 1 question, so reliability testing within the measures was not possible. The questionnaires were written in a simple and straightforward manner to accommodate English as learned language participants. All questionnaires were tested with a small group of international students (2–3 people) to make sure the language used was simple enough and the answers provided were meaningful. In addition, during recruitment, the authors made it clear that only those who spoke conversational English were eligible for the study.

Data Analysis

Chi-square tests were used to analyze food safety knowledge measures. Chi-square analysis considered experimental groups as the independent variable and reported answers for food safety knowledge as dependent variables. The researchers used ANOVA tests to evaluate behavioral intention and actual behavior measures. Normality tests (Levene’s test) were performed for the behavioral intention and actual behavior measures before ANOVA tests were performed. The normality tests showed that the distributions of both dependent variables for each experimental group were normal. Statistical tests were performed using SPSS 19.0 (IBM Corp, Armonk, NY, 2010) with $P = .05$.

RESULTS

A total of 78 individuals signed up to participate in the study. Participants included international students and refugees or immigrants originating from Bosnia, Somalia, Sudan, Liberia, Kurdistan, Bhutan, and Burundi. Upon consent, participants were randomly assigned to the following experimental conditions: food safety discussion map group ($n = 27$), cooking class group ($n = 21$), and control (no classes) group ($n = 25$). Five students were unable to attend the second cooking class and therefore were not included in the data analysis (eg, the study started with 26 participants and ended with 21). Although a power analysis was not performed to determine the number of participants needed, a general suggestion is that at least 15 cases in each condition may allow significance testing.10

Participant Demographics

Participants came from 19 foreign countries; the greatest number was from Somalia (34%), India (27%), Bosnia (14%), Sudan (11%), and Sri Lanka (10%). About 71% of participants had lived in the US for 5–35 months (under 3 years). Forty-eight participants (66%) identified themselves as female. About 75% of the participants were 18–30 years of age and 25% were ≥31 years of age. Approximately 43% of participants reported being married and about 57% reported being single, widowed, or separated. When asked about where they had learned cooking skills, the majority (88%) indicated they had learned from their mothers, followed by learning from their grandmother (36%), books (30%), their sister (16%), and other family members (8%). Seventy-four percent of participants reported being the primary cook in their households. More than half cooked for infants or small children and about 26% prepared food for senior persons. When comparing demographic information across the groups, the researchers found no significant differences among participants regarding their time of residency in the United States ($\chi^2$ [degrees of freedom (df) = 10; n = 70] = 15.09; $P = .13$) or their age ($\chi^2$ [df = 14; n = 71] = 19.68; $P = .14$). There were more females (n = 24) than males (n = 1) in the control group. Nevertheless, the gender split in the cooking and the map groups was not different ($\chi^2$ [df = 1; n = 47] = .001; $P = .97$).

Food Safety Knowledge

Table 1 presents the percentage of participants who provided the correct answers for the food safety knowledge questions. Specifically, the post-training knowledge scores for the

| Table 2. Means and Standard Deviations of Food Safety Behavioral Intention (Post-Education) Among Refugees and Immigrants, by Teaching Condition |
|-----------------|-----------------|-----|-----|
| Behavioral Intention                                      | Cooking Class ($n = 21$) | Map Class ($n = 27$) | F   | P   |
| I Intend to wash my hands with soap and running water before I prepare food. | 5.0 (0.00) | 4.7 (0.99) | 1.86 | .18 |
| After I touch raw meat, chicken, or fish, I intend to wash my hands with soup and running water. | 5.0 (0.00) | 4.6 (1.04) | 2.63 | .11 |
| I intend to wash the cutting board with soup and running water after using it. | 5.0 (0.00) | 4.6 (1.34) | 2.30 | .14 |
| I intend to unfreeze frozen meat in the refrigerator. | 3.1 (1.72) | 3.7 (1.51) | 2.21 | .14 |
| I intend to unfreeze meat under cold running water. | 3.4 (1.83) | 3.7 (1.57) | .34 | .56 |
| I intend to unfreeze meat using microwave. | 3.6 (1.43) | 3.5 (1.70) | .05 | .83 |
| I intend to use a food thermometer when I cook a large piece of meat to make sure it’s safe to eat. | 4.7 (0.90) | 3.7 (1.77) | 5.67 | .02 |
| I intend to put cooked meat, soup, or rice in the refrigerator within 2 hours after it is cooked. | 4.8 (0.60) | 4.4 (1.15) | 2.52 | .12 |

Note: Scales for behavioral intention items range from 1 = very unlikely to 5 = very likely; numbers in parentheses are standard deviations. One-way ANOVA tests were used to access the mean differences across teaching conditions.
The researchers collected information about the adoption of food safety behaviors 2 weeks after participants received the education programs. Analysis of variance tests showed that self-reported food safety behaviors were more positive ($P < .05$) for individuals who participated in the discussion map and cooking classes compared with individuals in the control group. Participants in both class types reported higher frequency than did those in the control group for washing hands before food preparation; washing hands after raw meat preparation; cleaning cutting boards using soap and running water; using a food thermometer when cooking large pieces of meat; refrigerating cooked food within 2 hours; and thawing meat using refrigeration, running water, or a microwave. Post hoc analysis also showed that participants in the cooking class reported higher frequency of using a food thermometer when cooking large pieces of meat than did those from map classes ($P < .01$) (Table 3).

### DISCUSSION

The goal of this study was to evaluate the effectiveness of a food safety

### Table 3. Means and Standard Deviations of Self-Reported Food Safety Behaviors (After 2 Weeks) Among Refugees and Immigrants, by Experimental Group

<table>
<thead>
<tr>
<th>Food Safety Behavior</th>
<th>Cooking Class (n = 21) Mean</th>
<th>Map Class (n = 27) Mean</th>
<th>Control Group (n = 25) Mean</th>
<th>$F$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>I wash my hands with soap and running water before I prepare food.</td>
<td>4.9a (0.30)</td>
<td>4.8a (0.64)</td>
<td>4.0b (1.17)</td>
<td>8.12</td>
<td>.001</td>
</tr>
<tr>
<td>After I touch raw meat, chicken, or fish, I wash my hands with soap and running water.</td>
<td>4.9a (0.48)</td>
<td>4.9a (0.32)</td>
<td>3.8b (1.86)</td>
<td>6.81</td>
<td>.002</td>
</tr>
<tr>
<td>I wash the cutting board with soap and running water after I have cut raw meat, chicken, or fish.</td>
<td>5.0a (0.00)</td>
<td>4.6a (0.84)</td>
<td>3.8b (1.79)</td>
<td>7.05</td>
<td>.002</td>
</tr>
<tr>
<td>I unfreeze frozen meat in the refrigerator, under cold running water, or in the microwave.</td>
<td>5.0a (0.00)</td>
<td>4.6a (0.84)</td>
<td>3.8b (1.79)</td>
<td>7.05</td>
<td>.002</td>
</tr>
<tr>
<td>I use a food thermometer when I cook a large piece of meat to know it’s safe to eat.</td>
<td>4.7a (0.73)</td>
<td>4.3a (1.00)</td>
<td>3.5b (1.81)</td>
<td>5.01</td>
<td>.009</td>
</tr>
<tr>
<td>I put cooked meat, soup, or rice in the refrigerator within 2 hours after it is cooked.</td>
<td>4.9a (0.48)</td>
<td>4.6a (0.70)</td>
<td>3.5b (1.85)</td>
<td>8.26</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note: Scales for food safety behaviors range from 1 = never to 5 = always; numbers in parentheses are standard deviations. One-way ANOVA tests were used to access mean differences across teaching conditions; means with different superscripts within rows differed at $P < .05$ using Bonferroni post hoc analysis.
discussion map as a method to increase knowledge and improve food safety behaviors among a refugee and immigrant population. The authors also sought to determine how this method compares with a traditional cooking class in achieving these results. Compared with the control group, both educational methods resulted in higher scores for food safety knowledge, intention to improve food safety practices, and self-reported food safety behaviors. Scores of intention to use a food thermometer (post-education) and self-reported food thermometer use (2 weeks post-education) were higher in cooking class than in map participants. Many participants emigrated from African and South Asian countries, where meat consumption is among the lowest compared with the global average. Cultures from these countries prefer thinly sliced cuts of meat, a preparation method in which taking the internal temperature is not as important as when preparing larger cuts such as roasts. 

Teaching scientific concepts such as food safety to oral culture learners poses a challenge because individuals with this learning and communication style typically retain information best when it is given verbally or shared by someone they know, and is presented using examples they can relate to life experiences. Furthermore, oral culture learners prefer interaction to internalize this knowledge and change behaviors. Participants in this study also reported learning cooking skills from a family member rather than formal instruction or print resources. The food safety discussion map is an educational method tailored to the communication style of oral culture learners.

According to Garnweidner et al., health promotion communication and educational materials are more effective when tailored to varying levels of cultural sensitivity, matching materials to the population and incorporating social and cultural influences. The food safety discussion map achieved this on both levels: (1) It was designed specifically for oral culture learners, and (2) social and cultural practices and themes were naturally a large component of the tool’s structure because participants share personal experiences and practices of their home life, traditions, and culture.

In a similar study, Sperl-Hillen et al. sought to compare the effectiveness of a diabetes conversation map (group education) with traditional, individual educational counseling as a method of improving diabetes self-management. In that study, individual education was more effective than the conversation map; however, participants in the study had been diagnosed and living with diabetes for an average of 11.7 years, and conversation map facilitators lacked experience in this role. Through focus groups with diabetes conversation map educators (facilitators), Fernandes et al. concluded that diabetes conversation maps may be more appropriate for participants who are newly diagnosed, with no previous education related to diabetes management. The current authors liken participants in the current study to “newly diagnosed diabetics”; the discussion map may have been their first exposure to food safety education. Conversation map facilitators in the study by Fernandes et al. thought that the success or effectiveness of the diabetes conversation map relied heavily on a favorable group dynamic. Groups with individuals perceived as having conflicting personalities tended to have low completion rates. Conversely, groups in which the same participants attended all educational sessions and formed bonds that existed outside the class were reported to be most successful. The effectiveness of the food safety discussion map also could be attributed to a favorable group dynamic. Because networking was used to recruit participants for this study, many participants likely were friends or relatives. Existing relationships may have established a comfort level that supported ideal conditions for facilitating conversation.

The Fight BAC! concepts addressed in both the educational interventions and the measures may not be appropriate to the audience in this study. Participants in this study may be unaccustomed to, or may rarely cook, large pieces of meat. The focus was to teach all 4 of the comprehensive Fight BAC concepts because, as refugees and new immigrants adopt American foods, the skill of taking the internal temperature of meat may become more important. Another limitation of this study is the lack of a power analysis to guide the number of participants required to determine a significant effect; therefore, in those cases where no significance was found, there may have been too few participants to see an effect.

IMPLICATIONS FOR RESEARCH AND PRACTICE

For the participants in this study, the food safety discussion map proved to be an effective method for providing food safety education, and was as effective as the traditional cooking class. The food safety discussion map method provides an alternative to the traditional hands-on cooking class and is more convenient, simple to use and prepare, and inexpensive. After the initial investment in the map and associated educational tools, no food preparation supplies or cooking facilities are needed. For example, a typical cooking class may carry an expense of about $5 per person for food and supplies. Depending on the situation and available resources, either tool would be useful for teaching food safety concepts and skills, provided that the facilitator or class instructor is trained in food safety concepts.

As a result of pilot testing the cooking and food safety discussion map, the researchers have a greater understanding of the strengths and limitations of both methods. The cooking classes are hands-on, which stimulates skill building. However, the cooking classes are time-consuming and resource intensive. The food safety discussion map was simple to use and prepare, beneficial for oral and visual learners, and inexpensive. The food safety discussion map class incorporated hand-on activities and visual demonstrations. This research indicated that for the measures tested, teaching food safety concepts to English language learners using a food safety discussion map that stimulates thought and conversation was as effective as a hands-on cooking class.
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REFERENCES


