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3 Grocery store (or supermarket) tours as an effective nutrition education medium: A systematic
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Grocery store (or supermarket) tours as an effective nutrition education medium: A systematic review

ABSTRACT

Objective: To evaluate evidence regarding grocery store tours as an effective nutrition education medium for improving nutrition knowledge and food-related behaviors.

Design: A systematic literature review of studies published from 1984-2015, concerning grocery store (or supermarket) tours and impact on nutrition knowledge and behaviors. Three investigators independently reviewed articles, extracted details, and assessed quality of each study.

Results: Out of 307 citations identified, eight were reviewed and six were of neutral quality. Increases in nutrition knowledge were reported in four studies, as evaluated by investigator-designed quizzes, with short intervals between tours and assessments. Six programs assessed behavior change using subjective reports or objective purchasing behavior measures; two studies did not perform statistical analyses. The six studies that reported positive health-related outcomes had varying topics, tour lengths, and target audiences.

Conclusions and Implications: Grocery store tours are increasingly used as an avenue for nutrition education to improve knowledge and/or alter food selection behaviors and may result in positive outcomes, but it is unknown if these outcomes persist for longer than three months post-tour and whether there are common attributes of effective grocery store tours. More rigorous studies with uniform methodology in study design and outcome measures are needed to confirm the effectiveness of supermarket tours.

Key Words: Grocery store, health behaviors, nutrition education, supermarket, tour

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INTRODUCTION

Despite a well-established link between healthful dietary patterns and lower risk of chronic disease, many adults and children fall short of dietary recommendations that promote health.¹ One activity that may facilitate the achievement of healthful dietary patterns is grocery shopping for healthy foods. Interestingly, the average number of trips to a supermarket in the United States has declined from 2.2 trips/wk in 2010 to 1.5 in 2015,² likely due to a continued increase in eating away from home³ and greater use of convenience foods.⁴⁻⁶ Participants in a recent focus group indicated that price and knowledge about the risks/benefits of food choices were important motivators for healthful grocery purchasing choices.⁷

Additionally, between 53% to 62% of U.S. consumers report “at least sometimes” using nutrition facts labels,^{8,9} but actual label comprehension and use for product comparisons are skills perceived as confusing and difficult by many.¹⁰ Strategies to increase nutrition label use and comprehension have been called for by researchers and policymakers.^{1,9,11,12}

One method to address consumers’ grocery shopping practices and increase their nutrition label comprehension is facilitator-led grocery store (or supermarket) tours. Such structured tours take small groups through a grocery store to teach participants strategies and skills that enable healthful food purchasing choices. The dietitian Leni Reed is credited with beginning supermarket tours in the early 1980s, as she took individuals out of traditional classrooms and brought them into stores for experiential learning.^{13,14} Based on the practicality

of grocery stores containing tangible food items and providing contextual learning environments, supermarket tours have flourished as a nutrition education medium. However, the effectiveness of grocery store tours has not been systematically evaluated.

A recent systematic review summarized many supermarket-based interventions.¹⁵ Only two grocery store tours were included, and findings were pooled with other assorted point-of-purchase interventions that utilized shelf-markers or printed brochures as the primary intervention.¹⁵ In contrast, the current review focuses only on outcomes from in-person grocery store tours to examine the effectiveness of contextual learning on consumer knowledge and behaviors.

In the current review, supermarket tour or grocery store tour is operationally defined as the dissemination of nutrition information and/or food shopping strategies by an educator to a small group of individuals while moving from aisle to aisle within a market that sells a wide variety of food products. Using this definition, three primary research questions guided this review: 1) Do grocery store tours lead to knowledge gains? If so, are increases in knowledge retained after three months or longer, following intervention? 2) Do grocery store tours lead to behavior change? If so, do these changes persist after three months or longer, following intervention? 3) What attributes of grocery store tours are associated with health-related outcomes being positively met? Three months was considered a desirable follow-up interval based on the Transtheoretical Model of behavior change, which considers this to be an appropriate estimate for the transition from action to maintenance stage of change.¹⁶

METHODS

Search Strategy

One graduate student of nutritional sciences (BS in dietetics; CJNI) and two PhD, RD investigators (HMI; SNR) conducted a systematic search and review of the literature published between December 2014 through June 2015, using guidelines published by the Centre for Reviews and Dissemination.¹⁷ Two internet databases were used to identify resources (EBSCO Host Academic Search Complete and Springer Standard Collection, which index over 14,000 journals and abstracts). Search terms, used in varying combinations, included “tour,” “nutrition,” “grocery,” “education,” “supermarket,” and “grocery store.” Additionally, a manual search of each relevant article’s references was conducted, and a cited reference search based on all relevant articles was performed to expand scope to the latest publications via Web of Science.

For inclusion, resources must have been published in English as a research-based article or abstract between January 1984 to April 2015, and utilized a supermarket tour as a nutrition education method and reported outcomes directly attributable to the tour. All types of research designs were included. Contact with authors of relevant published papers was prohibited after the review was initiated to avoid potential bias.¹⁸ To provide a comprehensive review of the literature, studies were not excluded based on type of grocer, size of sample, target audience, specific focus of the tour’s subject matter or study design. Abstracts were not included due to inadequate details for full data extraction and inability to assess quality. A total of 307 citations were identified. After duplicates were removed, 241 records were excluded based on their title or abstract. One relevant article was not included, due to the inability to locate research details beyond the title. Thirty-two, full-text publications were examined by the lead investigator. Articles were excluded if no knowledge or behavior outcome data were reported, if the tour did

not match the operational definition provided above, or if the supermarket tour played a minor role in the intervention and the outcomes could not be linked solely to the tour. Eight studies were included after exclusion criteria were applied (Figure 1) and were critically reviewed by each of three investigators, during which details were extracted.

Data Extraction And Quality Assessment

Data related to study characteristics, participant characteristics, intervention and setting as well as outcome data and results were extracted from each study in the final critical review.¹⁷ Though the focus was on nutrition knowledge and behavior, all outcomes were examined and evaluated. Each investigator independently performed data extractions, and component qualities were agreed upon after discussing any discrepancies.

Each study was classified as A, B, C or D, according to the strength of the research design based on the Evidence Analysis Manual's hierarchy and classification system to provide an initial snapshot of their level of evidence.¹⁹ A quality criteria checklist¹⁹ was used to rate each study as negative, neutral or positive. These ratings were based on answers to four relevance questions and 10 validity questions as determined by details reported in each article. If all relevance and most validity questions were positively answered as "yes", an article was rated positive. In contrast, negative ratings were assigned when a minority of validity questions were answered positively, and neutral ratings were assigned when there was a mixture of positive and negative answers. Quality assessments were independently conducted by three investigators for each full article, and final quality ratings were agreed upon after discussing any discrepancies. Research characteristics and quality ratings for each article are displayed in the Table.

Unique measurement tools used across studies and insufficient reporting of statistical analyses prevented a meta-analysis. Thus, a descriptive synthesis which explored themes and limitations of the current body of research was conducted. Summaries regarding knowledge and behavior outcomes along with theoretical foundations of studies were prepared. Discussion of study characteristics associated with positive health outcomes includes only studies which reported statistical analyses, due to limitations of implying significance without analyses.

RESULTS

Six studies were non-randomized, non-controlled trials with a “D” classification,²⁰⁻²⁵ and two were non-randomized controlled trials with a “C” classification.^{26,27} Quality assessments of the eight papers revealed one positive rating,²⁷ six neutral,^{20,22-26} and one negative.²¹

Some investigations did not explicitly report participant gender.²¹⁻²⁴ Of studies that reported gender,^{20,25-27} most hosted tours for exclusively female participants.²⁵⁻²⁷ None of the studies reported socioeconomic status of tour participants, but low socioeconomic status was inferred in one study which conducted tours with WIC participants.²⁶ The two most common foci for grocery store tours were general healthful dietary behaviors^{21,24,27} and cardiac health-related dietary behaviors.^{20,23}

Study Designs

Six studies utilized a non-controlled trial research design where an intervention group was the only source of data.²⁰⁻²⁵ Pre- and post-tests were used to assess participant outcomes in four of these studies,²²⁻²⁵ while the other two only included post-tests.^{20,21} Two programs used

naturally occurring control groups in their recruited participant pool to compare to their tour group.^{26,27} Sample size goals based on power analyses were not cited in any of the studies. Sample sizes ranged from 9 participants²⁰ to 947.²⁴ Of seven studies which reported size of tour groups,^{20-25,27} the majority had groups of fifteen or smaller.^{20,21,23,25,27} Additionally, statistical analyses were not presented in two of the eight articles.^{20,21}

Knowledge

Five of the studies measured knowledge change in their participants;^{20,22,24-26} four of these five found that participants had an increase in knowledge after the tour.^{20,22,25,26} Investigator-designed topic-specific multi-question quizzes were the most common method for knowledge assessment.^{22,24-26} These quizzes were given to participants before and after attending the tour to assess change. One study assessed knowledge change based on participants' written reports of information they had gained post-tour in an open-answer format, and increased knowledge was reported based on the number of individuals who opted to write in an answer.²⁰ The validity or reliability of these instruments were not reported in any of the articles.

Each study that assessed knowledge,^{20,22,24-26} chose to measure this at unique time intervals after the tour. One study assessed knowledge gain immediately after the tour without any additional follow-up.²² Other studies assessed knowledge with a delayed follow-up, ranging from one week²⁴ to one month²⁰ to up to two months after the tour.^{25,26} None of the studies measuring knowledge, assessed retention at three months post-tour or later, the amount of time that would place individuals in transition from action to maintenance stage of behavioral change.¹⁶

Behavior

Behavior assessments were collected in six of the eight studies.^{20,21,23,25-27} Measurement tools were widely heterogeneous among studies, but most assessed behavior change with subjective self-reports from participants. Self-report measures varied from general reports of “increasing variety in diets”²⁰ or “reducing fat intake”²⁵ to reported frequency of utilizing strategies presented or purchasing products highlighted in the tour.^{21,26,27} One study assessed purchasing behavior change with objective measurements, by utilizing grocery store loyalty card purchasing data for a 7-week period pre-tour and a 7-week period post-tour.²³ Neither validity or reliability of assessment instruments were addressed.

All six studies that assessed behavior change reported that participants had at least one positive behavior change after attending the grocery store tours.^{20,21,23,25-27} However, few studies described data analyses.^{23,26,27} Additionally, the interval between grocery tour and follow-up with participants varied between studies. The shortest follow-up interval was one month post-tour,^{20,27} and the longest interval was three months post-tour.²¹ The study utilizing loyalty cards was unclear regarding the interval between tour and follow-up data collection, simply reporting data were collected for a 7-week period.²³

Attributes Of Tours With Positive Outcomes

The eight studies measured additional health-related outcomes, such as participant intentions,^{21,22,25,26} attitudes,^{24,26} dietary behavior^{20,21,25-27} and purchasing behaviors.²³ Extraction of characteristics from these studies was conducted for the six articles that reported statistical analyses.²²⁻²⁷ Of these six studies, five found positive change in at least one health-related outcome.^{22,23,25-27} The topics of these tours were varied, audiences differed by age and gender,

and length of tours ranged from one, 1.5-hour session^{23,25} to three, 1-hour sessions.²⁶ Increased knowledge and behavior change were reported after three, 1-hour tours were completed by adult women of low income.²⁶ Increase in knowledge was reported by parents and children after attending a tour focused on whole grains.²² A cardiac dietary pattern was emphasized in one, 1.5-hour tour, which led to greater purchasing of “heart healthy” foods among participants (characteristics of which were not reported).²³ Adult women reported positive behavior change after attending one, 2-hour tour on general healthful dietary behaviors.²⁷ A statistically significant increase in knowledge was reported by children and adults after completing a one, 1.5-hour grocery store tour focused on low-fat foods.²⁵ Additional details of each study are found in the Table.

Theoretical Basis

Only one paper mentioned a theoretical basis for the grocery store tour.²⁶ The “Smart Shoppers Tour” was based on theory of planned behavior and self-efficacy theory with the goal “to increase the purchase of healthy foods by mothers on limited incomes.”^{26, p.323} This study found positive changes in attitudes and intentions related to tour goals.²⁶ Three additional studies, though not reporting the theoretical basis, measured intentions and reported positive change in participants after attending tours.^{21,22,25} Participant attitudes were measured in one additional study, but no change was found after participants attended a tour.²⁴ Of the four studies that found positive changes in these theoretical mediators of dietary behavior change, all found additional positive changes when they measured participant knowledge or behavior.^{21,22,25,26}

DISCUSSION

The objective of this review was to identify attributes of grocery store tours that promote and sustain improvements in knowledge and behavior change. Low quality studies prevented the ability to answer the primary research questions. Limited evidence suggests that grocery store tours have the potential to increase knowledge and improve behaviors, but such studies are unique on multiple design parameters, and commonalities across studies do not exist to adequately guide practices at present. When measured, theoretical mediators of behavior change are positively changed, suggesting that foundations in behavior change theory would be recommended when creating future supermarket tours. To develop high quality evidence of effective practices, valid and reliable methodological tools and high quality study designs should be utilized in the future. Supermarket tours are a unique mode of education, requiring collaboration with grocers as well as transportation of educators and participants to an atypical site, and are often conducted with small group sizes. Their distinct requirements and popular use warrant the demand to produce evidence of their effectiveness.

The most salient observation from this review and synthesis of studies is the lack of reported qualities commonly anticipated in scientific articles. Two investigations did not report statistical analyses and, thus, their results are only descriptive in nature with limited inferencing ability. None of the publications included statements acknowledging institutional review for research involving humans. One research team that partnered with an elementary school mentioned approval from an Education Director.²⁴ This suggests that tours were designed for programmatic and practical purposes, with lesser emphasis on effective systematic assessment. Reliability and validity of instruments was not addressed in any of the articles, and cannot be assumed. No studies reported power analyses for sample size needs. The studies performed with

small samples are assumed to be underpowered, and effects would be more difficult to detect. Finally, lack of control groups is an inherent limitation of the non-controlled trial design used by the majority of studies included in this review. No study utilized a study design with an A or B quality classification.

Increased knowledge was reported in several studies.^{20,22,25,26} However, each assessment was custom-created for the tours' specific focus, and thus, was inconsistent across interventions. Therefore, synthesis of results should be taken with caution. The short intervals between tour and assessment should also be considered, as a lack of longer-term follow-up prevented the ability to address the impact of knowledge retention beyond three months post-tour. Retention of participant knowledge gain beyond short-term cannot be assumed without longer-term testing.

In all studies that assessed behavior, participants had at least one positive behavior change after attending a supermarket tour. However, concerns of social-desirability bias are present with many of the studies utilizing self-report measures. The corroborating positive results from the study which utilized objective purchasing data from receipts and loyalty card information lends further evidence to suggest that positive behavior change may result from attending grocery store tours. However, the longest post-tour follow-up of three months was in a study which did not report statistical analyses,²¹ so sustained change has yet to be indisputably determined.

Constraints of included studies made it difficult to develop strong conclusions regarding characteristics that define an effective grocery store tour. Identifying tour qualities related to any of the additional outcomes was not feasible with the current research and the limited number of high quality studies available. Studies that found significant positive health-related outcomes did not appreciably differ from studies that did not report these outcomes. This indicates that

qualities related to successful change in positive health-related factors may be found in unreported or unmeasured facets of such interventions.

This review of the literature has recognized limitations. It is possible that inclusion of abstracts and unpublished work would have better informed the research questions. Only citations written in English were included in the review; this was considered appropriate as grocery store tours may play a different cultural role when performed in unique global cultures. Positive aspects of the review, such as inclusion of all study designs and range of publication dates, provide a comprehensive synthesis of published work on supermarket tours.

Based on the limited evidence, it would be unwise to develop a theory of how or if supermarket tours are effective at promoting sustained positive health-related change, at this time. However, results suggesting positive change in attitudes and intentions along with knowledge and behavior changes suggest that the theory of planned behavior may be a desirable model that should be assessed with stronger experimental designs. Though not explicitly reported by name in the current literature, social cognitive theory is another model that could mediate the impact of supermarket tours. Tours may influence an individual's self-efficacy related to grocery shopping behaviors as observational learning takes place in the contextual grocery store environment.

IMPLICATIONS FOR RESEARCH AND PRACTICE

With the current literature regarding grocery store tours primarily comprised of lower quality study designs, promising knowledge and behavior outcome results are not robust. Recommendations for future studies in this area are presented in Figure 2. Future research should utilize stronger study designs, including randomized controlled trials, to show a clear relationship

253 between intervention and any change in participants. Instruments to measure health-related
254 knowledge and behavior change should be valid and reliable. Knowledge and behavior should be
255 measured at least three months, if not six months, after the tour to evaluate whether changes are
256 maintained. Encouraging results from studies utilizing behavior change theory, supports use of
257 theories when developing and conducting future research on supermarket tours.

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334 Figure 1 Caption: “Figure 1. Flow diagram depicting study selection for the systematic literature
335 review on grocery store (supermarket) tours.”

336 Figure 2 Caption: “Figure 2. Methodological considerations and recommendations for designing
337 future grocery store (or supermarket) tour interventions.”

Table. Characteristics of Studies Assessing Grocery Store (Supermarket) Tours, 1984-2015 (n=8)

Reference: Author(s) (Year), Research design, Class ^a , <i>Quality rating</i> ^b	Participants: Sample Size and Descriptive Characteristics	Intervention: <i>Title</i> (if given), Recruiting, Theoretical Basis, Design, Objective, Tour Length, Basic Components	Primary Outcomes: Outcome: Tool Characteristics; timing	Additional Outcomes: Outcome: Tool Characteristics; timing	Primary Results: Outcome: Reported results <u>Additional Results:</u> Outcome: Reported results
Baic and Thompson (2007) ²⁰ Design: Non Controlled Trial Class: D <i>Neutral</i>	Sample Size: n = 58 participants n = 10 follow-up survey recipients and 9 returned Descriptive Characteristics: Equal amount of men and women	<i>"Heart Healthy" tours</i> Recruiting: In-store posters, local print media and health professional referrals Theoretical Basis: NR ^c Objective: Assessment of feasibility and acceptability Number of Tour Periods: One Tour Length: NR Tour Size: 5-15 attendees Basic Components: Focused on heart healthy foods; label education; food preparation	Knowledge: Assessed n=10 clients recruited from health professionals via anonymous mail survey; one month post-tour Behavior: Measured with aforementioned survey	Interest: One question asked to n=48; post-tour Information novelty: One question asked to n=48; post-tour	Primary Results: Knowledge: New information was reported in open- answer format (n=10) Behavior: 100% (n=9) reported increasing diet variety, 89% (n=9) felt it was easier to follow a healthy diet, (n=9) made dietary changes <u>Additional Results:</u> Interest: 98% (n=48) found the tour interesting Information novelty: 75% (n=48) reported learning new info
Carson and Hedl (1998) ²⁶	Sample Size: n = 315 women completed pretest	<i>Smart Shoppers Tour</i> Recruiting: Peer-leaders solicited participants	Knowledge: 16- question test with word/picture	Attitude: Two items, agree/disagree to	Primary Results: Knowledge: Mean quiz scores increased

<p>Design: Non-Randomized Controlled Trial</p> <p>Class: C</p> <p><i>Neutral</i></p>	<p>n = 128 women completed pretest and attended tour(s) n = 114 women attended tour(s) and completed two month follow-up</p> <p>Descriptive Characteristics: Average age of 28, parent of two children, unemployed with some high school education. Majority Caucasian and WIC recipients</p>	<p>from WIC clinics and other assistance programs</p> <p>Theoretical Basis: Theory of Planned Behavior and Self-Efficacy Theory</p> <p>Objective: Increase healthy food purchases by using labels and unit costs (facilitated by changes in attitudes, self-efficacy and knowledge)</p> <p>Number of Tour Periods: Three</p> <p>Tour Length: 1 hour</p> <p>Tour Size: NR</p> <p>Basic Components: Focused on grains, produce, and low-fat meat and dairy; meal planning; shopping tips; taste tests. Led by trained peers in English and Spanish.</p>	<p>matching; at recruitment and two months after tour</p> <p>Behavior: Two items, agree/disagree to statements “I use the nutrition label” and “I compare unit cost”; home food inventory of tour-specific foods; at recruitment and two months after tour</p>	<p>“healthy foods do not taste good” and “healthy foods cost more”; at recruitment and two months after tour</p> <p>Intention: Five items, agree/disagree to statements about intending to buy healthy foods; at recruitment and two months after tour</p> <p>Self-Efficacy: One question asked if agree/disagree to “have skills to buy healthy foods for family”; at recruitment and two months after tour</p> <p>Subjective Norms: Two questions, asked if they agree/disagree to “their family thinks it is good to eat a certain amount of fruits</p>	<p>8% from 11.96 (out of 16) to 12.89 with effect size of 0.39 (P<0.0001)</p> <p>Behavior: Increased nutrition label use (P=0.005); no change in unit cost use</p> <p><u>Additional Results:</u> Attitudes: Increased disagreement that healthy foods cost more (P=0.007) and no change regarding “healthy foods taste good”</p> <p>Intention: Increased intentions to buy whole grains (P=0.006) and low-fat milk (P=0.002). No change regarding fruits, vegetables or low-fat meat.</p> <p>Self-Efficacy: Increase in agreement (P=0.002)</p> <p>Subjective Norms: No change</p>
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				and vegetables each day”; at recruitment and two months after tour	
<p>Crawford and Kalina (1993)²¹</p> <p>Design: Non Controlled Trial</p> <p>Class: D</p> <p><i>Negative</i></p>	<p>Sample Size: n = 48 participants</p> <p>Descriptive Characteristics: NR</p>	<p><i>The Shop Smart Tour</i></p> <p>Recruiting: In-store advertisements, mailed fliers and word-of-mouth</p> <p>Theoretical Basis: NR</p> <p>Objective: Increase food choices that decrease risk of nutrition-related diseases</p> <p>Number of Tour Periods: One</p> <p>Tour Length: 1.5 hours</p> <p>Tour Size: 8-10 attendees</p> <p>Basic Components: Based on “Supermarket Nutrition Education Kit”; label education; alternative food products, cost-effectiveness; food preparation</p>	<p>Knowledge: NR</p> <p>Behavior: Assessment whether dietary change intention had been realized. Purchasing behavior assessed; 3-months post-tour</p>	<p>Intention: Assessed intentions regarding specific behaviors and food groups; post-tour</p>	<p>Primary Results:</p> <p>Behavior: People “generally” made their intended dietary changes with the exception of decreasing dietary fat. “Greater number” of products were being purchased</p> <p><u>Additional Results:</u></p> <p>Intention: Expressed intentions included: 33.3% read food labels, 29.2% reduce dietary fat and 22.9% reduce red meat consumption. 41.7% incorporate low fat cheese/yogurt into diet, 29.2% incorporate legumes and 22.9% incorporate whole grains</p>
Lafferty and colleagues	<p>Sample Size: n = 25 students</p>	<p><i>No title</i></p> <p>Recruiting: NR</p>	<p>Knowledge: Asked label terms and</p>	<p>Intention: Assessed</p>	<p>Primary Results:</p> <p>Knowledge: Parents</p>

<p>(2006)²²</p> <p>Design: Non Controlled Trial</p> <p>Class: D</p> <p><i>Neutral</i></p>	<p>(4th–5th grade) and n = 27 parents and children</p> <p>Descriptive Characteristics: NR</p>	<p>Theoretical Basis: NR</p> <p>Objective: Improve knowledge of and ability to identify whole-grain products</p> <p>Number of Tour Periods: One</p> <p>Tour Length: NR</p> <p>Tour Size: 25-27 attendees</p> <p>Basic Components: Lecture before tour, focused on identifying whole-grain products; Student group included a taste-test; Parent-child group had package term activity and recipes provided</p>	<p>location of whole grain products within store; pre and post-tour</p> <p>Behavior: NR</p>	<p>intentions to ask for parents to purchase whole grain products (student group) or intentions to purchase products (parent-child group); pre and post-tour</p> <p>Skills: Ability to differentiate whole grain from refined-grain products based on ingredient lists and nutrition facts panels; pre and post-tour</p>	<p>and children both significantly increased knowledge, but in different areas (P<0.01 overall)</p> <p><u>Additional Results:</u></p> <p>Intention: Parents had greater intention to purchase children's requested whole-grain products (P-value NR)</p> <p>Skills: Parents improved ability to identify whole-grain products (P<0.003)</p>
<p>Sadler and colleagues (2003)²³</p> <p>Design: Non Controlled Trial</p> <p>Class: D</p> <p><i>Neutral</i></p>	<p>Sample Size: n = 459 participants gave evaluation n = 223 provided purchasing information</p> <p>Descriptive Characteristics: NR</p>	<p><i>Healthy Heart Store Tours</i></p> <p>Recruiting: Posters and announcements in stores, advertisements in local press and in offices</p> <p>Theoretical Basis: NR</p> <p>Objective: Provide a tour for those interested in heart health</p> <p>Number of Tour Periods: One</p> <p>Tour Length: 1.5 hours</p> <p>Tour Size: Limit of 10</p>	<p>Knowledge: NR</p> <p>Behavior: Purchasing behavior evaluated with data from loyalty card; 7 week period before and 7 week period after tour</p>	<p>Motivation for Attendance: One question, asked participants why they chose to attend; post-tour</p>	<p>Primary Results:</p> <p>Behavior: Increase in healthier spread purchases by 4% (P<0.05) and fruit and vegetable purchases decreased by 5% (P-value NR)</p> <p><u>Additional Results:</u></p> <p>Motivation for Attendance: Most frequent (42%) reason was a health</p>

		<p>attendees</p> <p>Basic Components: 15 minute lecture before tour; emphasis on specific aisles and products; followed by formal question and answer period</p>			<p>problem present in the participant or someone they knew</p>
<p>Silzer and colleagues (1994)²⁷</p> <p>Design: Non-Randomized Controlled Trial</p> <p>Class: C</p> <p><i>Positive</i></p>	<p>Sample Size: n = 61 females in treatment group, 12 lost to follow-up (n=49 final follow-up treatment group) n = 63 females in control group</p> <p>Descriptive Characteristics: Majority 30-39 years old with at least high school education</p>	<p><i>Supermarket Safari Nutrition Education Tours</i></p> <p>Recruiting: NR, participants called health department</p> <p>Theoretical Basis: NR</p> <p>Objective: Identify changes in food selection and preparation after tour, in comparison to control</p> <p>Number of Tour Periods: One</p> <p>Tour Length: 2 hours</p> <p>Tour Size: 10-12 attendees</p> <p>Basic Components: Led by dietitian; focused on low-fat, low-sodium foods and high fiber foods; label education; food preparation</p>	<p>Knowledge: NR</p> <p>Behavior: 16 question skill and behavior checklist; frequency and yes/no/don't know format asked types of food purchased, information read on labels, and food preparation practices; pre-tour and one-month post- tour via mail</p>	<p>None</p>	<p>Primary Results:</p> <p>Behaviors: Gain in behavior survey score was significantly higher in the treatment group when compared to the control (P<0.001)</p> <p><u>Additional Results:</u></p> <p>None</p>
<p>Smith and Kalina</p>	<p>Sample Size: n = 947</p>	<p><i>Kids Shop Smart Tours</i></p> <p>Recruiting: NR</p>	<p>Knowledge: "Quiz" with questions about</p>	<p>Attitude: Questions about</p>	<p>Primary Results:</p> <p>Knowledge: Average</p>

<p>(2004)²⁴</p> <p>Design: Non Controlled Trial</p> <p>Class: D</p> <p><i>Neutral</i></p>	<p>participants n = 496 returned pre and post attitude surveys n = 45 students (in grade 3 classes) returned knowledge quizzes</p> <p>Descriptive Characteristics: 68% did not report ethnicity and 11% reported special dietary needs</p>	<p>Theoretical Basis: NR</p> <p>Objective: Impact attitudes toward trying a new variety of foods and develop ability to recognize the four food groups of Canada's Food Guide to Healthy Eating</p> <p>Number of Tour Periods: NR</p> <p>Tour Length: NR</p> <p>Tour Size: 20 attendees</p> <p>Basic Components: NR, described in separate article not accessible at time of review</p>	<p>four food groups and examples that would be in each, asked to treatment and control grade three classes; one-week post-tour</p> <p>Behavior: NR</p>	<p>attitude regarding trying new foods and eating a variety of foods with a Likert-type scale asked to caregivers; one-week pre and post-tour</p>	<p>scores (out of 20) were 10.24 for treatment group and 11.4 for control group (n.s. difference)</p> <p><u>Additional Results:</u></p> <p>Attitude: Regarding trying new foods, the pre-tour mean of 4.6 (out of 7) decreased to 4.59 post-tour, (n.s. change). The pre-tour mean, regarding eating a variety of foods, was 4.54 and increased to 4.61 post-tour (n.s. change)</p>
<p>van Assema and colleagues (1998)²⁵</p> <p>Design: Non Controlled Trial</p> <p>Class: D</p> <p><i>Neutral</i></p>	<p>Sample Size: n = 419, given post-tour assessment n = 145, given 5-7 week follow-up behavior assessment n = 310 given pre-tour knowledge assessment n = 305 given post-tour</p>	<p><i>No title, part of Beware of Fat campaign</i></p> <p>Recruiting: Press conference, press releases, local newspaper advertisements, posters and pamphlets and local groups were contacted</p> <p>Theoretical Basis: NR</p> <p>Objective: Increase both knowledge and awareness of fat intake/content and create intention to reduce fat</p>	<p>Knowledge: 9-question quiz, assessed at pre and post-tour and 5-7 week follow-up phone call</p> <p>Behavior: Questions on fat intake reduction; 5-7 week follow-up phone call</p>	<p>Intention: Questions on intentions to reduce fat intake; post-tour</p> <p>Awareness: Questions on awareness of fat intake; post-tour</p>	<p>Primary Results:</p> <p>Knowledge: Student group increased from 5.3 to 6.4 post-tour (P<0.01) and 6.2 at follow-up (P-value NR). Adult scores increased from 5.8 to 6.8 post-tour (P<0.01) and 6.6 at follow-up (P-value NR).</p> <p>Behavior: 63% of students and 75% of</p>

	<p>knowledge assessment n = 86 given 5-7 week follow-up knowledge assessment</p> <p>Descriptive Characteristics: Majority female, primary food shopper, range of ages (including students under age 16, and women >40 years old), primarily low education level, in households with two or more family members</p>	<p>intake</p> <p>Number of Tour Periods: One</p> <p>Tour Length: 1-2 hours</p> <p>Tour Size: 8 attendees</p> <p>Basic Components: Brief lecture before tour; led by dietitian; focused on different food groups; used posters and products and small tasks to keep participants engaged; taste test of cheeses with different fat content; Materials given to participants to take home</p>			<p>adults reported reducing fat intake</p> <p><u>Additional Results:</u> Intention: 45% of students and 70% of adults reported intention to increase purchases of low fat items Awareness: “Most” were more aware of their own fat intake</p>
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NR^a = Not Reported

Class^a = Studies were classified as A, B, C or D, according to the strength of the research design based on the Academy of Nutrition and Dietetics’ Evidence Analysis Manual’s hierarchy and classification system

Quality rating^b = A quality criteria checklist from the Academy of Nutrition and Dietetics’ Evidence Analysis Manual was used to rate each study as negative, neutral or positive. Ratings were based on answers to four relevance questions and 10 validity questions according to information reported within each article. If all relevance and most validity questions were checked as “yes”, an article was rated positive. In contrast, negative ratings were assigned when a minority of validity questions were answered positively, and neutral ratings were assigned when there was a mixture of positive and negative answers.

Figure 1

Figure 2

Identification of Need

- ◇ Conduct a community nutrition needs assessment to identify whether a grocery store tour is necessary (and what type of nutrition education intervention is desired) for the target audience

Tour Components

- ◇ When available and appropriate for the target audience, use a previously existing curriculum to facilitate comparability of results across previous studies and program reports of grocery store tours
- ◇ If an appropriate curriculum is not available:
 - » Ground a new tour in a theoretical framework of behavioral change
 - » Develop the tour based on appropriate dietary guidance for the target audience
 - » Establish content validity with expert review

Research Design

- ◇ Apply a strong design, such as randomized controlled trial or clustered randomized trial, to optimize strength of outcomes and conclusions from the grocery store tour
- ◇ Conduct a power analysis to identify the sample size needed to detect the tour's effect
- ◇ Obtain approval for research with human participants before initiating the tour
- ◇ Conduct statistical analyses, beyond simply reporting of participant characteristics

Assessment

- ◇ Tailor the evaluation to the dose and content of the tour
- ◇ Measure outcomes using tools with established validity and reliability
- ◇ If valid and reliable measurement tools or techniques are not available:
 - » Develop and pilot test new assessment materials to demonstrate validity and reliability of these instruments
- ◇ Follow-up with participants at least three months after the tour to evaluate retention of change on outcome measures

Evaluation and Dissemination

- ◇ Statistical significance and tests should be reported with enough detail to be replicable
- ◇ Share the findings of the intervention in appropriate peer-reviewed avenues

Additional Resources

- Cates S, Blitstein J, Hersey J, Kosa K, Flicker L, Morgan K, Bell L. *Addressing the Challenges of Conducting Effective Supplemental Nutrition Assistance Program Education (SNAP-Ed) Evaluations: A Step-by-Step Guide*. Prepared by Altarum Institute and RTI International for the U.S. Department of Agriculture, Food and Nutrition Service. 2014.
- Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *Am J Public Health*. 1999;89(9):1322-1327.
- Monsen ER. *Research: Successful Approaches*. Chicago, IL: American Dietetic Association. 1992.
- United States Department of Agriculture. *Nutrition Education: Principles of Sound Impact Evaluation*. Washington, DC: Food and Nutrition Service. September 2005.