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Implementation of Media Production Activities in an Intervention Designed to Reduce Sugar-Sweetened Beverage Intake among Adults

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Abstract

Objective—To inform the implementation of media production activities with adult populations by describing the construction of counter advertisements (ads) within a behavioral intervention.

Design—Content analysis

Setting—Southwestern Virginia, USA

Participants—Participants (n=40) were mostly female (85%) and white (93%) and 28% were low health literate.

Intervention—Participants could create 2 types counter ads during SIP^{smart}ER's media literacy lesson.

Main Outcome Measures—Completion rates, content, techniques used, and persuasive intent were compared by ad type and health literacy status.

Analysis—Descriptive statistics; Fisher's exact tests

Results—Each participant produced 2.1 (SD=0.8) ads. Ads included health risks (64%) and nutrition facts (16%). The majority used persuasive techniques (72%) and were persuasive to drink fewer sugar-sweetened beverages (72%). There were differences by type but not by health literacy status.

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Conclusions and Implications—Findings suggest counters ad can be executed in behavioral interventions for adults. Guidance to support their implementation is provided.

Keywords

health education; health literacy; advertising as topic; adult

INTRODUCTION

Nutrition education interventions use behavior change techniques (BCTs) – such as barrier identification, self-monitoring, and relapse prevention – to foster the motivation and behavior-specific skills needed to change the target behavior.¹ Most evidenced-based interventions incorporate multiple BCTs, and there is a need to understand more about the implementation processes of specific BCTs.² Reporting this information is vital to support the dissemination of evidence-based interventions and BCTs.

Compared to other BCTs, media literacy education (MLE) strategies and their implementation processes are relatively understudied.³ Yet, it is well established that marketing efforts, such as advertising, are among the factors that can negatively impact health behaviors, including those related to dietary intake.⁴ Media literacy education can lessen this impact^{5,6} by fostering the development of skills necessary to critically evaluate marketing and advertising⁷ and empowering individuals to act on their evaluations.^{8,9} Media literacy education strategies include describing common persuasive techniques, analyzing media messages, and creating media products, such as counter advertisements (ads). Evidence suggests that the active creation of media products may be more effective to change attitudes and behavioral intentions than analyzing media messages or learning about persuasive techniques.^{10,11}

Understanding the execution of MLE strategies among adults is important for nutrition education interventions. There general calls to enhance adults' media literacy skills⁷ and to specifically incorporate media production activities.¹² Additionally, the marketing and advertising of unhealthful foods, notably SSBs, is widespread¹³ and influences adults' behavior.^{14,15} However, of the 3 known nutrition-related interventions that incorporate MLE techniques,^{16–18} none included media production activities.

This study seeks to extend what is known about the implementation of MLE techniques in behavioral interventions for adults by describing the implementation of a media production activity in *SIPsmartER*. *SIPsmartER*, a behavioral intervention targeting sugar-sweetened beverage (SSB) consumption, has significantly improved SSB-specific media literacy skills ($P<0.001$) and reduced SSB intake ($P<0.001$).¹⁹ Specifically, this study presents (1) completion rates of 2 types of counter ads and (2) a content analysis of produced counter ads' content, use of persuasion techniques, and overall persuasiveness. Differences by type of counter ad type, mode of completion, and/or health literacy status are explored.

METHODS

This secondary analysis utilized data from counter ads produced in the *SIPsmartER* effectiveness trial. Procedures were approved by the Virginia Tech Institutional Review Board. Participants provided written informed consent.

SIPsmartER Intervention

The 6-month *SIPsmartER* intervention targeted SSB consumption among rural adults. Eligible participants were 18 years old, spoke English, consumed 200 calories from SSBs daily, did not have contraindications to physical activity, and had telephone access.²⁰ Participants were randomized by enrollment cohort into *SIPsmartER* or a comparison condition.

SIPsmartER incorporated multiple BCTs through 3 group classes, 1 teach-back call, and 11 interactive voice response calls.²⁰ The 2-hour group classes incorporated didactic and hands-on activities. A 20-minute teach-back call followed the first class and allowed participants to recall key class content and skills in a one-on-one setting. Through the automated interactive voice response calls, participants set new goals and received supportive messages. Complete descriptions of these components are available.²⁰

Media literacy education activities were embedded into the second class²⁰ and were based on Primack and Hobbs's media literacy theoretical framework.²¹ The activities addressed how marketing and advertising are tailored to specific populations and use persuasive techniques. Advertisements targeted towards southern and/or rural adults, such as SSB logos on NASCAR racecars and juice ads featuring country singers, were incorporated into the lesson. Media production was incorporated as a 20-minute activity during which participants could individually produce 2 types of counter ads: slogan modification (replacing a key word from well-known SSB slogans with a new word/phrase to make it better reflect reality) and truthful label (creating a new label for a SSB that included information missing from a normal label). Examples of each type of counter ad were provided. Participants were asked to produce 2 slogan modifications and 1 truthful label. This lesson was delivered by 2 PhD-trained health educators with MLE experience. Participants who did not attend the class had the opportunity to complete the lesson during an approximately 25-minute phone call.

Data Collection

Counter ads produced during the final 3 cohorts of the effectiveness trial were collected for analysis. As exploring media production implementation was not an original aim of the effectiveness trial, the systematic collection of counter ads did not occur until initial findings suggested *SIPsmartER*'s effectiveness to impact media literacy and behaviors. For counter ads produced in class, digital photographs were taken and labeled by participant identifier. For those produced during the missed class call, phrasing was recorded verbatim on the call script.

Demographic data were collected during recruitment. Health literacy status was assessed at baseline using the Newest Vital Sign;²² scores were collapsed into 2 categories: low health literacy (0–3 correct answers) and high health literacy (4–6 correct answers).

Data Coding

Photographs and recorded text were independently coded by 2 researchers using a codebook that assessed content, techniques used in counter ad construction, and persuasive intent related to SSB intake. A third coder settled unresolved discrepancies. The codebook, developed prior to coding, was informed by Primack and Hobbs's media literacy framework,²¹ Banerjee and colleagues' content analysis of adolescent media productions,²³ and SIPsmartER's content.²⁰ Unless otherwise noted, items were coded as yes/present=1 or no/missing=0. Table 1 shows examples of coded counter ads.

Counter ad content was coded as "nutrition facts" (e.g., nutrients), "health benefits of drinking fewer SSBs," "health risks of drinking SSBs," "other relevant" (i.e., applicable content not fitting in other categories), and/or "irrelevant" (i.e., content unrelated to the intent of the activity). Statements coded as "health risks" were further coded to determine if they were specific or general (e.g., "diabetes" versus "make you sick") and if the risk was 1 of 5 discussed in the first class: weight gain/obesity, diabetes, tooth decay, high blood pressure, and cancer.

Six items, which reflected Primack and Hobbs's 3 domains of media literacy,²¹ assessed techniques incorporated into counter ads. The Authors & Audience domain was assessed by determining whether the ad targeted a specific audience. Three items targeted the Messages & Meanings domain: (1) use of persuasive techniques, such as emotional appeal, (2) mimicking the style of an existing ad, and (3) use of an image. Slogan modifications were only scored for persuasive techniques. Two items addressed the Representation & Reality domain: accuracy of nutrition facts and health risks. Inaccurate statements had incorrect or distorted information.

Coders rated intent of each counter ad to persuade others on a three-item scale: "drink more SSBs" (1), "do not change SSB intake" (2), or "drink fewer SSBs" (3).

Analysis

Data were entered and analyzed using SPSS, version 24 (IBM, Armonk, NY, 2016). Frequencies and means/standard deviations were used to describe the study sample, completion rate of counter ads by participants (total number, number and proportion of each type of counter ad), counter ad content, strategies used, and persuasive intent. Fisher's exact tests were used to compare between completion and content analysis variables by mode of completion, health literacy status, and type of counter ad.

RESULTS

Participants

Forty participants created counter ads during the class (n=28; 70%) and missed class call (n=12, 30%). Participants were 48.0 (SD=10.8) years old and were 85% female (n=34) and 92.5% White (n=37). The majority made <\$25,000/year (75%, n=30), 37.5% (n=15) had high school education, and 27.5% (n=11) were low health literate. Compared to

participants from excluded cohorts, demographics only significantly differed for age (48.0 versus 41.4 years old).

Counter Advertisement Completion Rates

Participants created a total of 82 counter ads: 58 (71%) slogan modifications and 24 (29%) truthful labels. The majority ($n=66$, 80%) were completed in class. Participants produced an average of 2.1 ($SD=0.8$) counter ads each.

Slogan modifications and truthful labels were completed by 98% ($n=39$) and 60% ($n=24$) of participants. Approximately half (58%, $n=23$) completed both types. Participants completed 1.5 ($SD=0.6$) slogan modifications.

Completion rates did not vary by health literacy status for any of the completion variables (P range from 0.389 to 0.808), but they did vary by mode of completion. Participants who attended the class produced more total counter ads ($P<0.001$; 2.3 versus 1.4) and were more likely to produce truthful labels ($P=0.003$, 75% to 25%) than those who completed the lesson as a phone call.

Content Coding

Table 2 presents findings about counter ad content, techniques, and persuasiveness by counter ad type. Data about differences by health literacy status and mode of completion are only described in the text.

Overall, most ads included 1 type of relevant content (92%, $n=75$). Health risks were the most frequently included type of content ($n=47$, 57%). Nutrition facts were included in 16% ($n=13$) of counter ads while no ads included health benefits. Other relevant content (e.g., general descriptors, such as “bad” and “time bomb”) were included in 20% ($n=16$) of counter ads. Among ads with health risks, there were between 1 and 5 risks mentioned (median = 1). Specific risks discussed in class were included in 55% ($n=45$) of counter ads, with weight gain/obesity being most frequent (35%, $n=18$). Approximately 60% ($n=30$) included risks not discussed in class (e.g., “acid in soda can hurt your stomach”). Almost all (98%, $n=80$) counter ads targeted a general audience. Tools of persuasion were used in 81% ($n=66$) of ads. Among truthful labels, 64% mimicked existing types of advertisements (e.g., warning labels) and 57% included an image. All nutrition facts in counter ads were accurate while only 69% had accurate health risks. Inaccurate risks included statements like “low energy,” “memory problems,” and “addicting.” The majority of counter ads (72%, $n=59$) were coded as being persuasive to drink fewer SSBs. Only 20% ($n=18$) were coded as not having a persuasive intent while 6% ($n=5$), all of which were truthful labels, were coded as having a persuasive intent to drink more SSBs.

Compared to slogan modifications, truthful labels were more likely to include nutrition facts ($P=0.035$) and to be more likely to have 2 or more health risks ($P<0.001$). There were no differences by type for inclusion of risks ($P=0.146$), use of a persuasive technique ($P=0.795$), and accuracy of risks ($P<0.101$). High health literate participants were more likely to include risks (64% versus 38%, $P=0.045$). There were no differences for number of risks ($P=0.679$), presence of nutrition facts ($P=0.194$), accuracy of risks ($P=0.089$), and overall

persuasiveness ($P=0.151$). There were no differences by mode of completion: presence of knowledge ($P=0.196$), presence of risk ($P=0.166$), number of risks (0.145), use of persuasive techniques ($P=1.000$), accuracy of risks ($P=0.298$), and overall persuasiveness ($P=0.426$).

DISCUSSION

Findings from this study suggest that simple forms of media production can be accurately, persuasively, and feasibly executed as a short activity in a behavioral intervention targeting adults. On average, participants of varying health literacy levels equally created 2 counter ads that incorporated persuasive techniques and were persuasive to reduce SSB intake. In addition to incorporating class content (e.g., certain health risks and persuasive techniques), participants incorporated their own thoughts into the counter ad content.

The content, techniques used, and persuasiveness of the counter ads mirror those found in Banerjee and colleagues' analysis of open-format counter ads.²³ Although targeting different populations and behaviors, both studies included media production as a short activity within a larger intervention. Like the present study, Banerjee and colleagues found that the majority of counter ads produced were persuasive to the target behavior and contained mostly negative messages (i.e., risks). Taken together, the similarities of these findings identify expectations for the content and quality of counter ads produced in behavioral interventions for adults.

Additionally, findings provide initial insight into the incorporation of media production activities into interventions for adults. First, production rates, persuasiveness, content, and design of counter ads did not vary by health literacy level. This suggests that media production could be part of a universal health literacy approach.²⁴ Media literacy education can be considered under the umbrella of health literacy as MLE impacts how individuals access, understand, and act on information about food that impact health.²⁵ Second, there are potential differences in execution by type of counter ad, which suggests different strengths and weaknesses to consider when implementing them. Namely, slogan modifications were more frequently created while truthful labels included more inaccurate risks. These differences may be explained by differences in the design of each type. Slogan modifications were very structured and relatively simple - replace a word with another word or phrase. Taken together, this may allow for slogan modifications to be more readily produced. Truthful labels allowed for flexibility of content and design. This freedom or lack of structure could allow for more variation of content and its accuracy as well as hinder some participants from producing them as it requires them to be "creative."

Although this study was unable to connect participation in the counter ad activity to outcomes, there is evidence to suggest that media production activities can impact behavior among adolescents and young adults by demystifying media²⁶ and improving attitudes, perceptions of social norms, and behavioral intentions.^{10,11} Therefore, these findings provide evidence that may aid the further implementation of this promising behavior change technique.

There are several limitations to this study. The generalizability of findings are impacted by its mostly female and White sample; however, the sample is diverse in educational attainment and health literacy levels. Additionally, the small sample size did not allow for robust exploration of differences by type of counter ads, health literacy status, and mode. Lastly, it was not possible to link participation engagement with the media production activity to changes in outcomes related to media literacy (e.g., attitudes towards SSB advertising) and SSB behaviors. Breaking apart the “blackbox” (i.e., combination of multiple BCTs) is a common issue among interventions, as trials are usually designed to test the effectiveness of the entire intervention, not the specific components, on outcomes.² Nonetheless, this study provides support for future studies to replicate MLE methods and assess the impact of media production activities on behavioral and media literacy outcomes.

IMPLICATIONS FOR RESEARCH AND PRACTICE

This study extends what is known about the incorporation of MLE techniques in behavioral interventions for adults and provides guidance to help nutrition educators include counter ads as a BCT. This guidance may be of particular importance for nutrition educators who work in programs, such as Supplemental Nutrition Assistance Program Education (SNAP-eD) and the Extended Food and Nutrition Education Program (EFNEP). The populations these programs serve may be more likely to consume unhealthy and highly advertised foods and beverages, such as drinking SSBs.^{27,28} However, more needs to be known about the implementation process and effectiveness of this BCT in behavioral interventions for adults. Future research should address participant acceptance of media production, determine how quality of media production varies by health literacy status and mode of completion, and explore how engagement with media production impacts behavioral outcomes.

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Table 1

Examples of Participant Produced Media Productions

Participant Produced Counter Ad	Type of content	Tools used	Accurate facts and/or risks	Persuasive to drink	SSB
(specific) risk	persuasion technique	yes	less
nutrition "fact"	persuasion technique	yes	more
other	persuasion technique	--	less
irrelevant	none	--	no influence
(general) risk	persuasion technique	yes	less
other	persuasion technique	--	more
nutrition "fact"	none	yes	no influence	

Participant Produced Counter Ad	Type of content	Tools used	Accurate facts and/or risks	Persuasive to drink__SSB
irrelevant	None	--	more
other	persuasion technique	--	less
nutrition "fact" (specific) risk	persuasion technique mimic	yes	less
(specific) risk	persuasion technique	no	less
(specific) risk	persuasion technique mimic	yes	less
nutrition "fact" (specific) risk	persuasion technique image	yes	no influence

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Participant Produced Counter Ad	Type of content	Tools used	Accurate facts and/or risks	Persuasive to drink	SSB
(specific) risk	persuasion technique mimic	yes	less
(specific) risk	persuasion technique mimic image	yes	less	

Table 2

Content of Participant-Produced Media Production by Type of Media Production

	All Examples (n=82)	Slogan Modification (n=58)	Truthful Labels (n=24)
Type of content	n (%)	n (%)	n (%)
Nutrition "facts" *	13 (16)	5 (9)	8 (33)
Health benefits	0 (0)	0 (0)	0 (0)
Health risks †	47 (57)	30 (52)	17 (71)
Number of risks *			
1	33 (70)	27 (90)	6 (35)
2 or more	14 (30)	3 (10)	11 (65)
Specific risks	36 (77)	21 (70)	15 (88)
Weight gain/obesity	18 (38)	11 (37)	7 (41)
Diabetes	12 (15)	3 (10)	9 (53)
Tooth decay	10 (21)	2 (7)	8 (47)
High blood pressure	3 (6)	0 (0)	3 (18)
Cancer	4 (9)	0 (0)	4 (24)
Other	30 (64)	17 (57)	13 (77)
Other relevant content	16 (20)	14 (24)	2 (8)
Irrelevant content	3 (4)	3 (5)	0 (0.0)
Techniques used in counter ad creation			
Target specific audience	2 (2)	1 (2)	1 (2)
Use persuasive technique †	60 (73)	42 (73)	18 (75)
Mimic advertising style ^a	16 (67)	--	16 (67)
Include image ^a	13 (54)	--	13 (54%)
Representation and Reality			
Report only accurate facts ^b	13 (100)	5 (100)	8 (100)
Report only accurate risks ^{c†}	32 (68)	23 (77)	9 (53)
Persuasive Intent †			
Drink fewer SSBs	59 (72)	40 (69)	19 (79)
Drink more SSBs	5 (6)	5 (9)	0 (0)
Not change	18 (22)	13 (23)	5 (21)

* Fisher's Exact test found significant differences between types of counter ads ($P<0.050$).

† Fisher's Exact test did not find significant differences between types of counter ads ($P>0.050$).

^a n equals number of truthful label type counter ads

^b n equals number of counter ads including nutrition facts

^c n equals number of counter ads including health risks