

“It was an unexpected bond”: How an emerging participant-driven online social network may be enhancing an eLearning nutrition education & supplemental produce intervention

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Abstract

Objective: The purpose of this paper is to describe a participant-driven, online text message-based social support network that emerged from an eLearning nutrition education and supplemental produce intervention.

Methods: Adults (n = 20) who utilized a safety-net clinic for their healthcare participated in a 12-week smartphone-based nutrition education eLearning program using loaned smartphones. Participants also received a box of fresh produce weekly. Participants received weekly text message reminders to collect their produce, and from this researcher-initiated reminder text, a supportive, participant-led, all-group text message thread commenced. Researchers collected all 471 text messages in this all-group thread and included them in the qualitative content analysis of pre and post intervention focus groups.

Results: The original design of the eLearning nutrition education program was to asynchronously engage learners with nutrition education resources. However, participants themselves initiated a robust group text message support system through which they shared encouragement, recipes, grocery shopping tips, and images of food they prepared with the produce box amongst themselves for the duration of the 12-week intervention.

Conclusion: The novel nature by which these participants voluntarily engaged in this peer-to-peer nutrition education-focused text message conversation exemplifies participants becoming agents in their own learning experience and will be used to enhance future eLearning nutrition education experiences developed by our team.

Keywords

Nutrition education, social support network, online learning

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Introduction

This paper reports on insights generated from an online, text message-based social support network that spontaneously emerged among participants in an innovative eLearning nutrition education and supplemental produce intervention. We report on the feasibility and outcomes of the intervention elsewhere.¹ Here, we examine the significance of this emergent social support network as a means to catalyze social support among learners and promote peer knowledge-sharing and problem-solving, and we glean lessons learned for future iterations of the program.

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Background

The United States Department of Agriculture Supplemental Nutrition Assistance Program Education (USDA SNAP-Ed) is a federally funded grant program that supports nutrition education and obesity prevention interventions for individuals eligible for Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps). One of the goals of SNAP-Ed is to provide education that is innovative, cost-effective, built on existing resources and collaborations, and evidence-based.² Despite persistent disparities in high-speed Internet access, access to mobile Internet-accessing devices (“smartphones”) is common even among populations experiencing low-income.³ Thus Internet-based nutrition education programs, as tailored eLearning environments, may provide avenues to expand outreach and decrease barriers of attending traditional face-to-face nutrition education classes.^{4,5} Researchers have explored use of eLearning nutrition education for low-income adults with promising results regarding feasibility of this method of nutrition education.^{6–9}

Research into the expanding field of Connected Health suggests that “being connected to someone who cares is good for your health”,¹⁰ and that technology can “level the playing field and bring much needed healthcare resources (emotional and informational support) to people in rural or sociodemographically disadvantaged regions” (p. 11). Although the vast majority of Connected Health has focused on one-way (provider → patient) and two-way (provider ↔ provider) connections between patients and providers,^{11,12} there is literature to suggest that the inclusion of a “social support component such as group text messaging” may enhance the effectiveness of a one-way text message-based health intervention.¹³ Further, online peer-support networks appear to be helpful for individuals coping with stigmatizing illness and those lacking social support in their face-to-face lives.¹⁴

The purpose of this overall project was to explore the feasibility of implementing a community-based collaboration among a local safety-net clinic, SNAP-Ed resources, and local farmers to provide nutrition education eLearning and supplemental fresh produce, and to examine its impact on clinical outcomes, food security, and acceptance among safety-net clinic patients.¹ In this paper, we report on the emergence of a unique, participant-driven, social support network that developed as an unexpected result of the original study design and explore the impact of this phenomenon on participants’ experiences. We find that over the course of this study, participants took control of the technological resources of this project to create a social

support network that served as a resource for peer support and knowledge exchange.

Methods

Study context

Details of the overall study design are reported elsewhere.¹ Twenty SNAP-Ed eligible adults who utilize one safety-net clinic in South Georgia received access to an eLearning nutrition education program via a loaned study smartphone with an unlimited paid data plan. The nutrition education eLearning programs included in this project, *Food eTalk* and *Food eTalk: Better U*, were developed by the University of Georgia SNAP-Ed team and tailored to the cultural preferences and education needs of Georgians who experience low income.^{6,7,15} These programs include 10 interactive eLearning lessons augmented with cooking, exercise, and ‘just-in-time’ educational videos. Topics include weight management, sodium reduction, food safety, food resource management, physical activity, recipes, and meal preparation tips. *Food eTalk* and *Food eTalk: Better U* are based on Dietary Approaches to Stop Hypertension (DASH) and Diabetes Prevention Program (DPP) principles, respectively. These two programs are interactive, in that participants receive information from the eLearning program and are prompted to respond to various learning games and activities; however, there is no built-in space for participants to interact with one another or with educators in the eLearning environment.

Participants also received a weekly box of produce including primarily seasonal, locally-grown fruit and vegetables for the duration of the 12-week intervention. The weekly fresh produce box was delivered to the safety-net clinic as this was a central location which was familiar to all participants. To remind participants of their weekly produce pick-up, the first author (SAS) sent an all-group text message to participants’ loaned smartphones each Tuesday morning to remind them of the pick-up. Participants engaged in focus group interviews prior to and after the 12-week intervention. The University of Georgia Institutional Review Board (IRB) approved the study protocol.

Sample

The sample included 26 SNAP-Ed eligible adults (≥ 18 years old) with income $\leq 185\%$ of the federal poverty level from the selected safety-net clinic (75% female and 40% African American). Twenty of these participants were enrolled in the intervention group, 6 were control participants. All participants were

invited to the “pre” focus group interviews, but only the participants who were in the intervention group were invited to the “post” intervention focus group. For the purpose of this study, only the intervention participants had access to the loaned smartphone, and only these participants were engaged in the participant-driven text message exchanges. None of the 20 intervention group participants withdrew from the study, and all completed the entire intervention and attended both pre and post focus groups. Participants were recruited by clinic collaborators using a convenience sampling method through the diabetes education program at the clinic. The diabetes education coordinator, and collaborator in this study, invited participants based on her knowledge of those who had voiced concerns about limited finances and subsequent limited access to healthful foods. Recruitment took approximately three days as participants were largely positive in their response to participate. To our knowledge, only four patients did not opt to participate due to their inability to get to the clinic to pick up produce box for 12 consecutive weeks. Participants were all fluent in English, and had a diagnosis of diabetes, hypertension, and/or hyperlipidemia or a combination of these. To our knowledge, and per comments by participants themselves, none of the participants knew each other prior to this research study.

Data

The data presented in this paper include text messages and images, as well as pre-/post-intervention focus group transcripts. All text messages ($n=471$) were exchanged in an “all group” thread that included the first author (SAS) and all 20 participants enrolled in the intervention. Following the intervention, text messages were transcribed to a word document to facilitate analysis. Images sent to the “all group” text message thread (72 images) were exported from the smartphone text interface to the aforementioned transcribed text message document. Texts that were not part of the “all group” thread that included only the first author and one participant have been excluded from this analysis. For the purposes of privacy, researchers decided not to explore any additional non-study related text messages left on loaned smartphones after participants returned them at the end of the study.

Focus groups were ~90 minutes in length and included 5–8 participants in each of the 5 “pre-intervention” focus groups and 3 “post-intervention” focus groups. All focus groups were led by the same trained qualitative researcher and first author on this paper (SAS). All focus groups were recorded and transcribed verbatim by a professional transcription service. The original intention of the focus groups was to

understand participants’ expectations and experiences with the supplemental produce and eLearning nutrition education program in general. These findings are reported elsewhere.¹ Focus group interview questions before the intervention included “Tell me about nutrition education in your community,” and an example question after the intervention was “Tell me what it was like being part of this program.” The post focus group interview question specific to text messages was “What was it like getting the text messages on your loaned phone?” Participants discussed text messages through participant-led discussion of their general experiences with the program, and the question specific to the text-message experience was only asked in one focus group (as it had been discussed organically in the other ‘post’ focus groups). Each participant received a gift card for their participation in each of the two focus groups (pre and post intervention) as well as a light meal at each focus group.

Analysis

Qualitative analysis focused on understanding the significance of the “all group” text exchanges on participants’ experiences. Analysis occurred in several phases: after transcribing all text messages and images shared via text to a word document, text message data were independently indexed by two researchers (SAS and JJT). One of these researchers was the moderator for focus groups, she was included on all group text message threads, and was closely engaged with the participants and all aspects of this research study. Both of the coders are trained qualitative researchers and have extensive experience coding both text and photo data. The lead researcher (SAS) also analyzed all focus group data not including the text message data, and these findings are reported elsewhere.¹ Researchers utilized qualitative content analysis methods on text message and focus group data.^{16,17} The researchers utilized the code book from the first round of analysis (results reported elsewhere, which did not include text message specific analysis)¹ and added inductive codes focused on characterizing the content of the texts/images, and interpreting it in the context of this intervention. Coded data from focus groups and text messages were triangulated to construct categories which led to overarching themes.¹⁸ Researchers used Atlas.ti (Mac Version 8.3.1) to digitize the process and facilitate transparency in coding.¹⁹

Results and discussion

Demographic details on the intervention participants ($n=20$) can be found in Table 1. Participants exchanged 471 all-group text messages or images

Table 1. Baseline demographics of participants in the SNAP-Ed eLearning nutrition education and supplemental produce intervention (N = 20).

Variables Mean±SD or n (%)	Intervention group (n = 20)
Age (years)	47.7 ± 12.1
Female	15 (75%)
White	11 (55%)
Black	6 (30%)
Non-Hispanic	18 (90%)
Food Insecure	11 (55%)

during the 12 weeks of this study. All 20 participants who enrolled in this intervention spontaneously contributed to the conversation by sending a mean (range) of 6 (2–42) all-group text messages. Notably, this was an emergent component of this project and not part of the original study design. When the researchers recognized this phenomenon emerging, they returned to University of Georgia IRB to request permission to collect and analyze the text messages/images to understand their significance to participants' experience in the study. (Per IRB recommendations, participants were given the opportunity to opt-out of including their text messages in the study. No one opted out.)

Through content analysis of the messages, images, and related focus group discussions, we find that participants utilized this emergent social support network to 1) create a supportive and encouraging community among themselves and 2) take ownership of knowledge-sharing and problem-solving. In addition, participants' text exchanges provided a critical resource for identifying future eLearning nutrition education and opportunities to expand/strengthen the program overall.

THEME 1: Through the exchange of group text messages, participants created a supportive and encouraging community among themselves

The content of the text messages themselves, and feedback about the text exchanges during the “post-intervention” focus group, was profoundly positive - demonstrating participants' appreciation for the project itself and their emerging sense of community. (The only ‘negative’ feedback about the texts was from participants who didn't realize they could turn off the sound notification on the loaned smartphone while

they were sleeping.) In the text messages, participants expressed gratitude for the opportunity to be involved in the project, gratitude to the farmer for supplying fresh produce, and gratitude to the safety-net clinic/staff for the medical care they've received.

“Hi everyone. I received the most beautiful veggies too - no blemishes. Top grade. Very impressed. Looking forward to Tuesday for more already. [...] thanks to Sarah, [the clinic contact], and our veggie man”

In response to others' texts, participants sent encouraging brief messages, such as, “you got a good thing goin' on”, “you are doing marvelous,” and thumbs up emojis. Through these brief exchanges, participants reinforced the sense that they were maintaining an ongoing connection in which they supported one another – an “ambient virtual co-presence” that Ito and Okabe (2005; p.264) describe as a “light-weight awareness of connection with others”.²⁰ Approximately 50% of the text messages were expressions of gratitude or encouragement.

Notably, because participants were using loaned smartphones with unlimited paid data plans, text messages were initially exchanged anonymously among participants. We suggest that this initial anonymity in a relatively small group gave participants agency over what information they shared, and when - allowing participants to simultaneously find a balance between being open and vulnerable (by asking questions and sharing experiences) while being in control (of their personal boundaries).¹ In a study of online communication among breast cancer patients, Orgad (2005; p.151) found the “anonymous and disembodied character of online communication” facilitated openness and the disclosure of personal experience, while also offering them control over the “leakage” of that information into other spaces.²¹

Within weeks, however, participants in this study began to build deeper connections and exchange more personal information—an example of what Faraj et al. call “swift trust” characteristic of online settings—including names, health status, successes, and setbacks in the context of supporting one another:²²

Pt:0613 Thumbs up (emoji). Way to go! My A1c was 14% months ago but it came down to 10% 3 months ago. I'm going to the Doc Thursday hopefully I will get another good report

Pt:0605 I know you will, keep up the good work!

Pt:0613 Thanks! The encouragement I have received from here helps. I'm excited for my own self. I've been stressed about a lot of things and that effects my blood sugar quick.

Pt:0605 GN [good night] for now. Message me personally we can exchange names and maybe help each other!

In the post-intervention focus group, participants also shared their affinity towards the group-based text messages and the support these messages provided one another.

Speaker 1: I'll tell you what's surprising the most is how quickly we kind of got together and started communicating and sending pictures and helping each other out picking out produce. Because before this, we didn't know each other.

Speaker 2: And it almost was like kind of a support group for encouragement for each other. I think that was the best part of the project.

Further, we found at least one example of these digital relationships making the jump to face-to-face friendships—what Wang & Wellman (2010) call “migratory friendships.”²³ At a post-program focus group, two participants who did not know one another prior to the program, reported walking together at a Susan G. Koman “Race for the Cure” walk that took place midway through the intervention. Another participant described it this way:

It was an unexpected bond. Like even right here. I'm sure none of us knew each other before this, but we're talking as if we've known each other for years.

In her overview of the role of technology in social life, Chayko notes that although it is infrequent for relationships to migrate from online to face-to-face (more commonly, face-to-face friendships migrate online), when they do, these relationships tend to be strong, supportive, and intimate.^{24,25}

THEME 2: Participants took ownership of knowledge-sharing and problem-solving through the exchange of text messages and images

From the beginning, participants were eager to share images of their produce boxes and the meals they prepared with the food (Figure 1). This catalyzed discussion among participants about the variety and quality of the food, as well as an exchange of recipes, cooking tips, and strategies for finding fresh, inexpensive food in their community. Approximately 25% of the text messages included these types of peer-to-peer tips. Participants also discussed how they were engaging their extended family and friends in this project by sharing produce and eLearning opportunities.

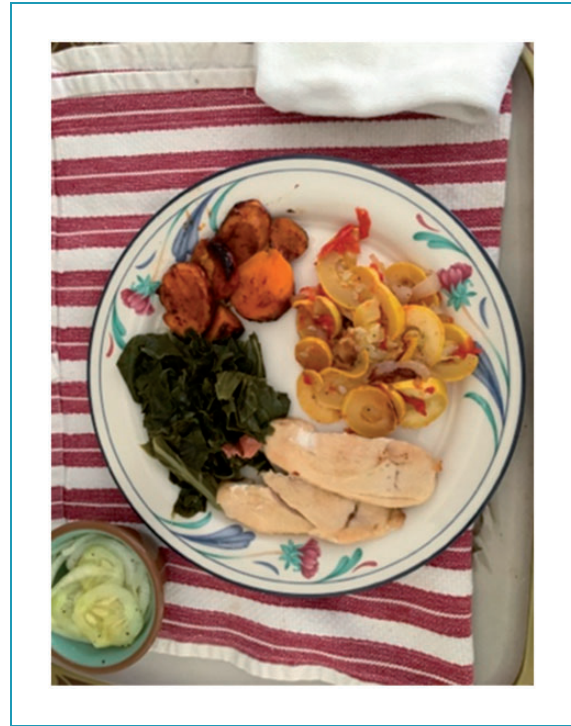


Figure 1. Image shared in all-group text message.

Notably, the initial group messages questions—which were generally regarding logistics of the study (e.g. running late to pick up their produce box)—were directed toward the researcher (SAS), who only participated in the group thread when a question was specifically asked of her regarding logistics of the study. (This included 17 researcher-specific questions and subsequent replies). Over the course of the study, questions were increasingly directed toward (and answered by) one another—as in the following exchange:

Pt:0618 Here's my \$3 meal. . . sauteed squash onion and 1 tomato, boiled sweet potato with cinnamon; greens cooked in chick n broth for flavor; side salad made of marinated cucumber and onion and one store bought chicken breast broiled in oven. Calories less than 500

Pt:0605 How do you make the chicken breast less dry?

Pt:0618 Add a little water to pan and cover with foil or dip chicken in Italian dressing.

Pt:0605 Okay, thanks.

Pt:0606 Yummy!

Pt:0616 Tonight I made a roast with the fresh green beans, onion, and potatoes. It was delicious

Pt:0619 Sounds yummy!

We interpret this as an example of the way that participants took ownership of knowledge-sharing and

problem-solving—knowledge flows that would not have been possible in this study without their “domestication” of the technology they had (quite literally) at hand.²⁶ Faraj et al. have argued that online communities are “dynamic spaces of collaboration” (p. 670) that “offer participants opportunities to learn, share, and mix knowledge in ways that have similarities with face-to-face communities of practice, but they extend them via the unique sociality offered online” (p.677-678).²²

THEME 3: Participants’ text exchanges offer researchers critical insight about future eLearning nutrition education and support needs/ opportunities

Whereas the above two themes demonstrate how participants creatively took control of the technology to support one another, build community, and take ownership of knowledge-sharing and problem-solving, researchers also found that participants’ text exchanges offered a critical resource for identifying needs and opportunities for future eLearning nutrition education and broader program support.

In particular, participants’ text messages revealed the need for additional nutrition education opportunities and registered dietitian guidance to support participants’ efforts to prepare the food in their produce boxes in ways that are healthy, motivating, and culturally appropriate. A few participants mentioned in texts that they had been told “not to eat potatoes” and to “avoid eating anything that is white.” This reported misinformation indicates the need for additional nutrition education to address gaps in knowledge related to healthful eating for diabetes and weight management. Misinformation or gaps in nutrition knowledge were identified in approximately 20% of the text messages.

Participants also made reference to tiring of eating the “same food over and over again” from the produce box and requested “more fruit like bananas.” The 2015-2020 Dietary Guidelines for Americans²⁷ encourages “variety” as a key message to improving nutrient intake, however the USDA’s Behavioral Risk Factor Surveillance data indicates most Americans do not meet recommended intake for variety in fruit and vegetables.²⁸ This suggests a unique opportunity for education about the value of consuming seasonal and regional produce to enhance health, improve food resource management, and support local growers—as well as the need for recipes and cooking techniques to help prepare the same food (e.g., collard greens) in several different ways to decrease ‘boredom’. This would help participants understand the rationale for the *local* contents of produce box and provide them with resources to mitigate their experience of dietary monotony.

Finally, participants shared the dilemma of thinking that Southern food is “unhealthy” but continuing to prefer and consume it because of habit and taste preferences, as in the following post-intervention focus group statement:

The one thing about Southerners, though, and greens is some people season them with smoked turkey, but most of us either use fat back or we use ... We were using some salty pork. They’re just not good otherwise, in my mind. I mean I’m a Southerner. I’ve seen them cooked other ways, but I don’t enjoy them any other way.

This suggests the need for education specific to preparing healthful, but tasty, versions of traditional regional or cultural foods. The literature suggests education opportunities including recipe adaptation, cooking techniques, and new-recipe tasting may be effective in addressing both of these concerns.^{29,30}

Implications and direction for future work

Originally, one-way information support drove the development of our asynchronous “interactive” eLearning nutrition education program, and we had planned to utilize the smartphones distributed as part of the current study to also provide one-way, text message-based reminders to participants to pick up their weekly produce box. Yet, the emergence of this participant-driven text message-based social support network demonstrates the additional potential of technology to support peer-to-peer connections that may enhance knowledge, health, and well-being.^{10,14}

In response to an initial group text reminder from the first author, participants’ text message conversations persisted for the entire 12-week intervention period and were augmented by conversations in the post-intervention focus groups about how much participants valued engaging with one another throughout the program. It is noteworthy that given the variety of social networking platforms available on smartphones, participants took advantage of one of the most basic smartphone-facilitated communication tools: text messaging. Further, text message communication remained relevant to the program goals: discussions centered around encouragement for eating well, engaging in physical activity, sharing food-based images, and tips on food resource management within the community. There were no superfluous, unrelated text message conversations on the whole-group text thread.

We find that over the course of this study, participants transformed from “subjects” in a nutrition education intervention study into “agents” who “domesticated” the technological resources of this project and creatively sculpted them into the peer support

network they needed.^{22,26} Through brief texts of support, participants demonstrated their support for, and “ambient virtual co-presence” with, one another,²⁰ and in at least one case the relationship formed via text “migrated” to the real world.²³ As participants began to direct and respond to one another’s questions, they also demonstrated their ownership of knowledge^{21,22} and problem-solving. Based on their texts, we have also identified several important topics for future eLearning education, including clarifying dietary recommendations for disease management, communicating the benefit/value of seasonal and regional eating, and tailoring recipes and cooking instruction to fit the seasonal produce and regional cooking preferences.

Future eLearning programs could integrate peer-to-peer communication as a means to connect learners, promote peer knowledge-sharing and problem-solving, and build community capacity among learners. However, given the organic emergence of this feature in the current study, several uncertainties remain: Participants were using loaned smartphones with temporary phone numbers; thus, participants were in control of what personal information they chose to share with the group (e.g., names and permanent contact information) and when to do so.²¹ It is not known if a similar robust text message social support network would have formed if participants were utilizing their own personal phones (phone numbers). Additionally, participants’ collective identification as “Southerners”, members of the same community, and patrons of the same local safety-net clinic may have contributed to their sense of group cohesion.³¹ It is unclear whether a more heterogeneous group of participants would have formed a similar bond, as suggested by the literature.³² Further, although participants took increased ownership of information-sharing, the presence of the first author in the group (as a researcher and “non-Southerner”) may have influenced the tone, content, and elaboration of the text messages.³³ Finally, our identification of knowledge gaps in participants’ text messages suggests that engagement by a registered dietitian could supplement participants’ own knowledge and, when necessary, limit the spread of misinformation among participants, yet it is unclear how increased participation by an outside “expert” might impact participants’ interactions and ownership of information and knowledge-sharing. Examples from the literature suggest mixed-interpretations as to whether social support networks improve health-related behaviors—with some suggesting positive results in weight loss,³⁴ some suggest no improvement related to medication adherence,³⁵ and one systematic review on physical activity as supported by social support networks suggesting that more work is needed to understand the relationship.³⁶ Future research is needed to determine the

optimal design for deliberately integrating and facilitating online peer-to-peer communication in eLearning nutrition education programs in ways that “inspire and strengthen social connectedness – in online *and* offline contexts”.²⁴

Conclusion

In this paper, we examine a participant-driven, online text message-based social support network that emerged within the context of a 12-week eLearning nutrition education and supplemental produce intervention for adults with diet-related illness who utilized a safety net clinic for their healthcare. By analyzing the content of participants’ “all group” text messages and pre-/post- intervention focus groups, we find that participants utilized this emergent social support network to create a supportive and encouraging community among themselves and take ownership of knowledge-sharing and problem-solving. The novel nature by which these participants voluntarily engaged in this peer-to-peer nutrition education-focused text message conversation exemplifies participants becoming agents in their own learning experience. More research is needed to determine the optimal design and integration of online peer-to-peer communication into eLearning nutrition education programs in ways that enhance participants’ experiences and outcomes.

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