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Using an E-Health Intervention to Promote the Health of Cancer Survivors with Pre-Existing Disabling Conditions

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Abstract

While there has been research on the use of e-health for cancer patients and those living with disabilities, no interventions focus on cancer survivors who had a disabling condition prior to their cancer. Therefore, we developed and piloted the feasibility of the online health-promotion program LiveAble. Based on a theoretically driven health promotion program previously shown to be effective among people with various chronic conditions, LiveAble was adapted to be an e-health intervention for cancer survivors with pre-existing disabilities. Eleven cancer survivors reviewed LiveAble and provided feedback. The group's average age was 54 years. Most had neuromuscular impairments prior to their cancer; about half were breast cancer survivors. Average scores on the Self-Efficacy for Health Practices Scale increased. Participants rated LiveAble useful, attractively presented, and relevant to people with disabilities. Their feedback also suggested areas for change, such as a system that was easier to navigate and more individualized. Only 51% of these participants agreed that LiveAble motivated them to take action to improve their health. To turn information into action, participants may need additional assistance and encouragement. While preliminary results were promising, future efforts should determine the efficacy of LiveAble with larger and more diverse groups of survivors.

Keywords

cancer survivors; disabilities; e-health

The potential for e-health – the delivery of healthcare services and information via the Internet and related technologies¹ – to improve the services patients receive and their health is vast. Indeed, 80% of U.S. Internet users (53% of U.S. adults), have looked online for information about health topics.² Internet-based resources are typically available around the clock, generally without cost, and can provide both a private resource in patients' healthcare management or a forum for community support.²

Given the potential of e-health in general, it is hardly surprising that healthcare researchers interested in improving the care and outcomes of cancer patients have explored the potential of e-health interventions. Such research has considered the Internet as a source for cancer information,^{3,4} as well as a potential resource for online support groups to help those coping with cancer diagnoses and recovery.^{5,6} More recent studies have examined the cancer patient characteristics that predict preferences for various web-based supports.⁷ Even as this kind of research progresses, however, there remains a need for empirical testing and validation of the Internet as a vehicle to improve the health of cancer survivors.

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Similarly, e-health has been seen as a tool to potentially improve healthcare for people living with disabilities and chronic health conditions. For example, Lorig reported that those participating in on-line self-care management interventions for diabetes or arthritis had improved self-efficacy, AIC levels, and self-reported symptoms, compared with usual care control groups.^{8,9} Online support groups could be helpful for those challenged to benefit from the social support afforded by face-to-face groups due to limitations in mobility, access, or communication.^{10,11} The Internet can also be used to provide interventions to people with transportation, time, or geographic restrictions.¹² Of course, the reality of how disability can impact Internet usage must be recognized when considering the full potential of e-health for those living with disabilities. Only 54% of adults with disabilities use the Internet, and they are less likely to have broadband access than those without disabilities.¹³ So, while e-health interventions have the potential to be a useful tool for improving the health of those living with disabilities, the interventions must be designed to meet their specific health literacy and technological needs.

In summary, there has been research on the use of e-health for cancer patients and those living with disabling conditions, although more studies of the effectiveness of e-health in these groups is needed. In addition, virtually no research has focused on cancer survivors who had a disabling condition prior to their cancer diagnosis. Thus, the purpose of this study was to develop and pilot the feasibility and efficacy of an online health promotion intervention for cancer survivors with pre-existing disabilities.

METHODS

Intervention Development

The LiveAble intervention was adapted from Stuifbergen's Lifestyle Counts wellness intervention that adopts a holistic approach to providing knowledge and addressing barriers, resources, and strategies for building self-efficacy.¹⁴ This theoretically driven intervention draws on both Bandura's self-efficacy model¹⁵ and Pender's Health Promotion model.¹⁶ Goal-setting, a key component of the intervention, moves participants from an understanding of health promoting behaviors into actions to implement a more healthy lifestyle. The intervention is adaptable to new information, while retaining the underlying efficacy-building structure. Lifestyle Counts was originally used in a randomized clinical trial of 113 women with multiple sclerosis. Compared with the control group, the intervention group significantly improved self-efficacy, reported health promoting behaviors and quality of life (i.e. pain and mental health functioning).¹⁴ This intervention has been adapted for women with fibromyalgia,¹⁷ as well as low-income cancer survivors.¹⁸

LiveAble is organized into seven modules: Maximizing Health in the Context of Multiple Chronic Conditions, Lifestyle Adjustments to Maximize Health, Engaging in Exercise and Physical Activity, Healthy Eating, Dealing with Emotions and Stress, Relationships, Intimacy, and Sex, and Building Relationships with Healthcare Providers. Each module contains evidence-based information, suggestions for using that information, and references to additional resources for that topic. In the current study, the content was updated and modified to address the needs of cancer survivors. The modules, which were critiqued by experts in various health promotion and oncology areas, also contain participant activities designed to build knowledge and encourage goal setting.

Translation into an On-Line Intervention

To increase its reach and flexibility, LiveAble was translated from its original print format to an online intervention. Formatting LiveAble for online use makes it accessible to people with disabilities for whom transportation to a meeting can be problematic, may be attractive

to individuals who do not prefer group formats, and provides an opportunity for participants to repeat the activities in the modules and revisit the material at a later time.

The first step in converting LiveAble to an online format was evaluating the paper-based materials for online feasibility. The content was assessed for potential navigational structure, length, and ease of reading. The structure of the paper format seemed well suited for online transformation, as it was already broken into small subsets of information that could easily be categorized online into folders.

In assessing the feasibility of an online format, the amount of text presented a concern. Too much textual content may be challenging for participants to read through, and even tedious. In order to break up the text, relevant images and video clips were added throughout the modules. Chunks of information that could be represented through graphs, charts, and tables were transformed from textual content to more visually pleasing images. Repetitive text was removed, and long sections of text were transformed into video clips.

A variety of factors were considered in choosing the appropriate online platform for LiveAble. The platform needed to be user friendly, easily accessible, have the option for inviting multiple users, and meet the requirements outlined by the host university regarding security and accessibility. Utilizing a standard HTML-style web page was considered as a possibility, though quickly dismissed, as it would require significant time and effort to develop a custom-built application. A final decision was made to use the online educational tool Blackboard. Choosing to work with Blackboard allowed for ease of implementing textual content and satisfied university regulations regarding accessibility, privacy, and security. Blackboard provided established templates for uploading the various forms of LiveAble content.

Several challenges were faced throughout the development of the online LiveAble intervention using the Blackboard platform, however. First, when uploading images to be included with textual content, there was no Blackboard feature present to wrap text around an image. A basic knowledge of HTML code was needed in order to accurately place images within text. Second, the activities that required users to enter information continually opened in new browser windows and tabs. When activities opened in new browser windows, the user was taken away from the original intervention page, reducing the ease of navigation in completing the entire module; while this might not be an issue for technologically savvy student users of Blackboard, this was considered a concern for LiveAble pilot users. Last, Blackboard provided a limited preview function. The appearance of the content to the editor was different than the appearance of the content in the preview function. Additionally, the content in both edit and preview mode differed significantly from the appearance of content to an actual user. Mock user credentials were required. Despite the fact that Blackboard was not a perfect match for every aspect of converting LiveAble to an online intervention, it was a useful and available tool for conducting this feasibility pilot.

The online format of LiveAble retains the seven originally developed modules, arranged into folders (see Figure 1). Within each folder, participants could move through the module's content by clicking through pages of text and images. Some of the modules contained self-guided activities, in which participants entered information to help them set personal goals. (see Figure 2). Many of the modules also included short video clips featuring experts demonstrating exercise, nutrition, and stress management techniques, as well as interviews with individuals with disabilities about health promotion topics. The online LiveAble intervention also contained a discussion board where participants could choose to contribute to on-going health discussions with moderators and other participants (Figure 3). The goal

of this online discussion board was to provide an interpersonal interaction component, as would be present in the group presentation version of LiveAble.

Procedure

After receiving IRB approval from the researchers' university, 85 e-mails were sent to participants with e-mail addresses who had participated in an earlier study of cancer survivors with pre-existing disabling conditions (from 8/4/11 to 9/30/11) and had agreed to participate in future research. Those with e-mail addresses were selected because it was assumed that they had convenient computer access. Of those initially invited, 15 people's e-mails were undeliverable and 23 people agreed to participate in the study. The university implementation of Blackboard required an ID and password, so IDs and passwords were created for each participant and sent to them through both e-mail and traditional mail; the informed consent documentation was also provided via e-mail and traditional mail. Pilot participants were told they could contact the research assistant throughout the study, if they had questions about using LiveAble.

Blackboard provided tools to track individuals' activity, making it possible to determine what each participant was doing within LiveAble. Twelve participants opened at least one intervention module, and 11 participants opened all modules and completed the final evaluation survey. One participant with multiple sclerosis could not finish the study, possibly due to the mild cognitive impairment that made it difficult for her to navigate the program; mild cognitive impairment has been reported in as many as half of those diagnosed with multiple sclerosis.¹⁹ Another participant with a mild cognitive problem did review the modules and was able to provide feedback by telephone.

Reminders were sent as needed to encourage completion of the review (maximum of three reminders). Participants contacted the research assistant when they finished reviewing all the modules. The research assistant then sent the LiveAble evaluation and self-efficacy measure by e-mail. The option of a hard copy was provided, but only one person preferred the hard copy to the electronic version. When the completed LiveAble evaluation was received, a \$50 money order was sent in appreciation for participation.

Instruments

The researchers developed an evaluation survey to assess participants' responses to the LiveAble on-line program. The survey consisted of 14 Likert-style items and three open-ended questions about program strengths, areas for improvement, and preference for face-to-face discussions. Respondents were also asked how much time they spent reviewing the modules.

The Self-Rated Abilities for Health Practices Scale (SRAP).^{20,21} was used to assess changes in self-efficacy following exposure to LiveAble. Designed to measure perceived ability to perform health-promoting practices, the 28 items sum to create a total score encompassing: Nutrition (including the ability to determine a healthy weight), Well-being, Physical Activity/Exercise, and Responsible Health Practices. Scores are based upon 5-point rating scales. Data support the reliability and validity of this scale among various groups of people with disabilities.²² In a recent study of women with multiple sclerosis, the Cronbach alpha coefficients ranged from .92 to .95.¹⁴ The SRAP was used in the earlier survey phase of this study of health promotion among cancer survivors with disabilities. As expected, the SRAP was highly related to reported frequencies of health promotion behaviors and moderately correlated with quality of life. The Cronbach alpha reliability coefficient was .92 for the total score. Because individuals participating in this Internet pilot had participated in the earlier

survey, their previous SRAP scores were used as the baseline self-efficacy measure in the analyses reported below.

RESULTS

Participants

Three males and eight females reviewed the online modules and provided feedback. Their average age was 55 (SD = 9.8). Five people had breast cancer; the other cancer types were prostate, colorectal, lymphoma, and melanoma. Eight participants had multiple sclerosis, and the remainder listed chronic fatigue syndrome, stroke, and schizophrenia as their pre-existing disabling conditions. All participants were white and nine had at least bachelor's degree. Participants resided in ten different states. Two were working and nine were currently not employed.

Participant Evaluations

Table 1 presents the responses to the 14 evaluation questions. Participants were most likely to agree that LiveAble covered useful content, was attractively presented, and was relevant to their disabling conditions. Ratings of ease of navigation, ease of linking to additional information, 'taught me something new', and 'motivated me to take action' were much lower. Participants were least likely to endorse the negatively worded items (e.g. 'hard to use' and 'needed a facilitator'). One third of the participants reported spending 2–3 hours reviewing the materials, one third spent more than three hours, and the remaining third spent two hours or less.

Participants also provided responses to open-ended questions about most helpful aspects of LiveAble and needed changes. The Maximizing Health, Engaging in Exercise and Physical Activity and Healthy Eating modules were most frequently mentioned positively. For example, participants stated that actually seeing the videos using Therabands were very helpful. In the nutrition area, up-to-date information about myplate.gov and about specific foods was helpful to them.

Three participants indicated that the content validated what they were already doing. The discussion of barriers and realistic ways to address them was also viewed as an asset. Some individuals suggested that they were already doing many of things suggested in the modules and that the content might be more helpful to those more newly diagnosed, although one participant did report setting goals after viewing the material. Another participant stated that she wished more people had used the discussion board to introduce new topics.

There were some specific suggestions for content changes. For example, one individual stated she would have liked more cancer related content. Another observed that an individual might be overwhelmed by being asked to work on multiple goals at once and suggested an alternative goal setting method. The most frequent suggestions for change, however, related to technical computer problems, particularly navigating the program in the Blackboard environment.

Changes in Reported Self-Efficacy for Health Promotion

Average self-efficacy scores increased in all four SRAP areas after viewing the on-line modules, compared to scores from the previous baseline survey (completed by mail an average of 22 months earlier). The average total SRAP score increased from 88.31 (SD=21.35) in the prior phase of this study to 93.02 (SD=13.25). While this change did not yield a paired t-test value that reached statistical significance at the .05 level, it was associated with a moderate effect (Cohen's d-value of .59). The greatest change was

observed in the Stress Management Score (Cohen's $d = .89$), while change was smallest in Responsible Health Practices (Cohen's $d = .12$).

DISCUSSION

Nurses are increasingly challenged to identify alternative ways to help their patients with chronic disabling conditions and their families promote their health. E-health interventions hold great promise because of their convenience, adaptability, and the interest they can engender. However, these programs must be carefully constructed and evaluated to meet patient needs.²³

Preliminary results from this initial pilot of LiveAble suggest that the participants found it provided useful information that was relevant to cancer survivors with pre-existing disabling conditions. None indicated that they would have preferred a face-to-face group intervention, although one person pointed out that there are definitely some people who prefer the group contact. We also note that the majority of those contacted chose not to participate in the online study, and this is a reminder that not everyone is attracted to internet interventions.

Although the feedback was generally positive, participants clearly wanted a system that was easier to navigate. Both the Blackboard interface and the participants' computer familiarity may have contributed to the relatively lower rating of the navigation item. One person who had difficulty initiating the intervention said the phone assistance provided the hands-on guidance needed to open the online modules and start the intervention. Since the majority of the participants in this study reported multiple sclerosis as their primary disabling condition, some may have had cognitive limitations, so such assistance may have been particularly important with this group.

Cancer is most likely to be diagnosed in older adults, and older computer users may have a wider range of computer literacy skills compared to younger computer users²⁴. Therefore, many cancer survivors who are older adults may need help in accessing and navigating e-health interventions. Also, when designing a program that may be used by older adults or those with disabilities, the principles of universal design will be particularly important to incorporate.^{25, 24}.

Several key takeaways for converting the paper-based manual to an online format emerged over the course of this process. The most noteworthy were:

- Much of the paper-based manual contained large chunks of text that could be translated into images and videos for the online format. In this process, organization is key. Having an outline, or a folder, to keep track of which images and videos go in which section of the online guide facilitates the process of uploading and arranging files on the Internet platform.
- It is important to preview the intervention as a user. For online platforms, the editor's view is often different from the user's view. Previewing both formats allows for consistent, accurate display of intervention material.
- It is useful to test the intervention using different Internet browsers. What may appear accurately in Internet Explorer may appear altered when viewed in Firefox.
- While Blackboard was a useful tool for quickly executing a feasibility pilot with limited resources, a more flexible platform would have been better at converting content to an online format – particularly when trying to design a user-friendly intervention for users with a variety of disabilities.

About half the respondents spent one to three hours reviewing all the modules. The original group intervention was presented in eight 90-minute sessions, so the on-line participants were spending considerably less time with the materials. Participants were instructed in advance that this study was a pilot study and the purpose was to determine their feedback, so it is possible that they focused on evaluating the program rather than trying to learn from the content or interact with others in the discussion board. Two of the major benefits of this kind of e-health intervention is the ability for participants to (1) move through materials at their own pace and (2) select and focus on content that is most relevant or novel. Additional investigation of how “actual” LiveAble users – rather than pilot users asked to provide feedback as reviewers and testers – is necessary to determine how long users would spend with the content, whether they go through the educational content quickly or slowly over time, which modules they use, and how they utilize the discussion board.

Given the small sample of eleven participants, it is not surprising that the changes in self-efficacy observed here did not reach conventional levels of statistical significance. However, the associated effect sizes (Cohen’s *d* values) suggest that the changes following exposure to the online program were moderately large for the total self-efficacy score and the stress management subscale. With this small, self-selected sample, these preliminary results may not generalize. Also, baseline self-efficacy scores were collected about 22 months before participants reviewed LiveAble, on average. A randomized control trial with a much larger sample and a shorter time between pre and post testing would be needed to determine if changes in self-efficacy could be attributed to the LiveAble program. Such studies should also determine who prefers e-health interventions, as opposed to other intervention modalities.

Only 51% of these participants agreed that LiveAble motivated them to take action to improve their health. To turn information into action, participants may need additional support and encouragement. One person suggested that telephone follow-up would enhance their ability to work toward health promotion goals; other participants needed assistance in navigating the program. Future studies should explore the most effective “mix” of on-line and personal components for the LiveAble intervention. One possible model is Lorig’s successful on-line interventions that include peer facilitators who encourage participation, monitor discussion board use, and provide individual problem-solving feedback.^{8,9}

Another way to promote health promotion changes may be to encourage more interactive discussions among users. A recent study by Richardson and colleagues²⁵ found that adding an online communities component to an internet-mediated exercise program reduced attrition, although it did not increase the number of steps taken. Also of interest is their finding that participants who reported lower social support at baseline were more likely to post more messages and viewed more of others’ posts, compared to those who reported higher social support. Particularly in the early stages of the community when the discussion is not yet active, the program facilitators may need to post questions or other information to promote on-line discussions.

Pilot participants’ comments also suggested that the power of a web-based program should be harnessed to personalize the intervention. The average time since cancer diagnosis was 8 years for this group. Some participants indicated that while the information appeared useful, they were already aware of much of it and that it might be more helpful to those who were newly diagnosed. Therefore a short on-line assessment component that could utilize background information to direct users to the most appropriate sections might significantly increase the utility of LiveAble.

CONCLUSION

While the preliminary response was promising, future efforts should determine the efficacy of LiveAble with larger and more diverse samples of survivors with pre-existing disabling conditions. The participants' reactions also point out that the challenge of such e-health interventions may not be in providing useful information, but in galvanizing the target population to use this information for making meaningful behavior change.

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References

1. Eysenbach G. What is e-health? J Med Internet Res. 2001; 3(2):e20. [PubMed: 11720962]
2. Fox, S. [Accessed February 25, 2012] The Social Life of Health Information. 2011. Available at http://pewinternet.org/~media/Files/Reports/2011/PIP_Social_Life_of_Health_Info.pdf
3. Sajid MS, Iftikhar MM, Monteiro RS, Miles AW, Woods WA, Baig MK. Internet information on colorectal cancer: commercialization and lack of quality control. Colorectal Dis. 2008; 10(4):352–356. [PubMed: 17645570]
4. Cowan CC, Hoskins RR. Information preferences of women receiving chemotherapy for breast cancer. Eur J Cancer Care. 2007; 16(6):543–550.
5. Han JY, Kim JH, Yoon HJ, Shim M, McTavish FM, Gustafson DH. Social and Psychological Determinants of Levels of Engagement With an Online Breast Cancer Support Group. JHealth Commun. 2012; 17(3):356–371. [PubMed: 22085215]
6. Klemm P. Effects of online support group format (moderated vs peer-led) on depressive symptoms and extent of participation in women with breast cancer. Comput InformNurs. 2012; 30(1):9–18.
7. Borosund E, Moore SM, Ruland C. Relationships between Patient Characteristics and the Use of an Internet-Based Self-Management Support System. Ann Behav Med. Apr.2012 43:S244–S244.
8. Lorig KR, Ritter PL, Laurent DD, Plant K. The internet-based arthritis self-management program: a one-year randomized trial for patients with arthritis or fibromyalgia. Arthritis Rheum. Jul 15; 2008 59(7):1009–17. [PubMed: 18576310]
9. Lorig KR, Ritter PL, Laurent DD, Plant K, Green M, Jernigan VBB, Case S. Online Diabetes Self-Management Program a randomized Study. Diabetes Care. Jun; 2010 33(6):1275–1281. [PubMed: 20299481]
10. Braithwaite DO, Waldron VR, Finn J. Communication of Social Support in Computer-Mediated Groups for People With Disabilities. Health Commun. 1999; 11(2):123–151. [PubMed: 16370973]
11. Barnfather A, Stewart M, Magill-Evans J, Ray L, Letourneau N. Computer-Mediated Support for Adolescents With Cerebral Palsy or Spina Bifida. Comput Inform Nurs. 2011; 29(1):24–33. [PubMed: 21099541]
12. Ghahari S, Packer T, Passmore A. Development, standardisation and pilot testing of an online fatigue self-management program. Disabil Rehabil. 2009; 31(21):1762–1772. [PubMed: 19479510]
13. Fox, S. [Accessed May 10, 2012] Americans living with disability and their technology profile. 2011. Available at http://pewinternet.org/~media/Files/Reports/2011/PIP_Disability.pdf
14. Stuijbergen AK, Becker H, Blozis S, Timmerman G, Kullberg V. A randomized clinical trial of a wellness intervention for women with multiple sclerosis. Arch Phys Med Rehabil. 2003; 84:467–476. [PubMed: 12690582]

15. Bandura A. Self-Efficacy - toward a Unifying Theory of Behavioral Change. *Psychol Rev.* 1977; 84(2):191–215. [PubMed: 847061]
16. Pender, NJ. Health promotion in nursing practice. Norwalk, CT: Appleton and Lange; 1987.
17. Stuijbergen AK, Harrison TC, Becker H, Carter P. Adaptation of a wellness intervention for women with chronic disabling conditions. *J Holist Nurs.* Mar; 2004 22(1):12–31. [PubMed: 15035239]
18. Meraviglia, M.; Stuijbergen, A.; Morgan, S.; Parson, D. Effects of a Health Promotion Intervention in low-income cancer survivors. Sigma Theta Tau International, National Conference; Oct 29 – November 2, 2011; Grapevine, TX. 2012.
19. Benedict RH, Cookfair D, Gavett R, et al. Validity of the minimal assessment of cognitive function in multiple sclerosis (MACFIMS). *J Int Neuropsychol Soc.* 2006; 12:549–558. [PubMed: 16981607]
20. Stuijbergen A, Seraphine A, Roberts G. An explanatory model of health promoting behavior and quality of life for persons with chronic disabling conditions. *Nurs Res.* 2000; 49(3):122–129. [PubMed: 10882316]
21. Becker H, Stuijbergen A, Oh HS, Hall S. Self-rated abilities for health practices: a health self-efficacy measure. *Health Values.* 1993; 17(5):42–50.
22. Callaghan D. Health behaviors, self-efficacy, self-care, and basic conditioning factors in older adults. *J Community Health Nurs.* 2005; 22(3):169–178. [PubMed: 16083404]
23. Nahm ES, Resnick B, Covington B. Development of theory-based, online health learning modules for older adults: Lessons learned. *Comput Inform Nurs.* Sep-Oct;2006 24(5):261–268. [PubMed: 16980778]
24. Dickinson A, Arnott J, Prior S. Methods for human - computer interaction research with older people. *Behaviour Inform Technol.* 2007; 26(4):343–352.
25. Hawthorn D. Interface design and engagement with older people. *Behaviour Inform Technol.* 2007; 26(4):333–341.

FIGURE 1.
Description of LiveAble modules

Preview Test: Activity 1: What's Your Nutritional IQ?

Description	This activity will help you improve your understanding of nutrition.
Instructions	For each question, select the answer you think best answers the question. At the end of this activity - check to see how you did! 8-10 Correct: You've got a great nutrition I.Q.! You've got what it takes to eat right and be at your best. Good for you! 5-7 Correct: You're on the verge! You understand the basics of good nutrition and fitness. Keep up the good work! 4 or Below: With a little more nutrition and fitness know-how, you can increase your nutrition I.Q. In no time! Just ask your doctor or registered dietitian for more information today. McDonald's Corporation ©. For more information, See the Resource section at the end of this module or a registered dietitian.
Multiple Attempts	This Test allows multiple attempts.
Force Completion	This Test can be saved and resumed later.

Test/Survey Status

Save All Answers Save and Submit

Question 1 10 points Save Answer

Mom always said to eat your vegetables. But just how many veggies should you be eating?

☒ A. none—what did mom know?
☐ B. one serving a day
☐ C. two servings a day
☐ D. three or more servings a day

Question 2 10 points Save Answer

It's 100 degrees in the shade and dehydration seems just around the corner. Which beverage is the wisest way to ward it off?

☐ A. a caffeinated soft drink
☐ B. water
☐ C. beer

FIGURE 2.
An example of self-guided activities

FIGURE 3.
LiveAble Discussion Board

Table 1

Mean Evaluation Ratings of LiveAble (n=11)

	Mean	SD	Percent Agreement
Covered useful content	1.55	.69	91%
Attractively presented	1.82	.60	91%
Relevant to disabling condition	1.91	.54	91%
Directions easy to follow	2.00	1.10	82%
Held attention	2.05	.85	82%
Links were easy to use	2.18	1.17	64%
Motivated to take action	2.18	1.25	55%
Easy to navigate	2.27	1.10	73%
Taught me something new	2.45	1.29	64%
Too time consuming ^a	3.09	1.14	46%
Presentation was distracting ^a	3.27	1.19	27%
Discussion board beneficial ^{a,b}	3.40	1.14	20%
Needed a facilitator ^a	3.64	1.50	18%
Hard to use ^a	3.82	.98	18%

5-point Likert scale was used. "1 = Strongly Agree", "3 = Not sure", and "5 = Strongly Disagree". The Agree and Strongly Agree ratings were compiled to create Percent Agreement.

^aOn these items, a low score indicates a negative evaluation

^bOnly 5 respondents rated this item.