10-2019

The Impact and Outcomes of Integrating Health Literacy Education Into Adult Basic Education Programs in Boston

Lorna Rivera
University of Massachusetts - Boston, lorna.rivera@umb.edu

Marcia Hohn

Recommended Citation

Hohn M., Rivera L.(2019). The Impact and Outcomes of Integrating Health Literacy Education Into Adult Basic Education Programs in Boston. HLRP: Health Literacy Research and Practice. 3(3 Suppl) S25-S32. doi: 10.3928/24748307-20190325-01 https://doi.org/10.3928/24748307-20190325-01

The Impact and Outcomes of Integrating Health Literacy Education Into Adult Basic Education Programs in Boston

Marcia Drew Hohn, EdD; and Lorna Rivera, PhD

ABSTRACT

Background: Adult basic education (ABE) is the national system that offers educational services in English language development, reading, writing, math, technology, and communications to adults with low literacy, limited English, or both. These services range from basic levels to high school equivalency, with specialty programs in transition to community colleges and family literacy. **Objective:** This study sought to analyze the role of ABE in increasing health literacy among low literate and limited English populations and to identify effective models for teaching and learning about health in this setting. **Methods:** During a 2-year period, 90 students from three ABE programs in Boston participated in health literacy classes focused on healthy eating and received prevention screening services through local public health organizations. The majority of students classified themselves as Black, African American, or Latino. Participants ranged in age from 18 to 35 years; 64% of the participants were women. The three research sites were located in the Roxbury neighborhood of Boston, where health disparities and poverty rates are disproportionately high. During the study period, researchers conducted semi-structured interviews with teachers ($N = 12$) from each of the participating classrooms to gather information about the students in their health classes. Researchers also conducted semi-structured interviews and focus groups ($N = 9$) with students at each site during the study period to examine how they described changes in their knowledge, attitudes, and actions regarding health. Researchers also conducted ethnographic field research by observing health classes at each site, which was supplemented by collecting teachers' lesson plans as well as materials produced by learners. **Key Results:** ABE programs are a good setting for adults with limited literacy or limited English to increase their health literacy. The programs, which provide steady learning environments over time with staff skilled in adult learning, allow students to engage with health information in the context of their everyday lives, thereby increasing the likelihood of healthier practices. **Conclusions**: ABE programs play a vital role in developing health literacy among low literacy populations and are part of the solution for addressing health disparities. **[*HLRP: Health Literacy Research and Practice*. 2019;3(Suppl.):S25-S32.]**

Plain Language Summary: This article describes the role that adult basic education plays in improving health literacy among low-literate and limited English populations. The impact and outcomes of learning about health were investigated for 90 adults in three programs in Boston where health disparity is high. The impact of different teaching/learning models also was compared.

Health disparities are a national social justice issue, and the adult basic education (ABE)/English for Speakers of Other Languages (ESOL) system can be part of the solution to this issue. This article presents research that investigates the impact and outcomes of integrating health literacy instruction for adults participating in ABE/ESOL programs. The catalyst for the increasing presence of health literacy education in ABE/ESOL programs was research in the 1990s that strongly linked low literacy with poor health, including high incidences of multiple chronic diseases (Davis, Meldrum, Tippy, Weiss, & Williams, 1996; Williams, Baker, Parker, & Nurss, 1998). At the same time, the term health literacy came

into broad use, defined as "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Ratzan & Parker, 2000). A wealth of studies have provided strong evidence showing that people with limited literacy skills also have low health literacy, affecting 93 million people in the United States. This statistic has alarmed both the ABE/ESOL and health care fields in the United States (Kutner et al., 2007; U.S. Department of Health & Human Services, Office of Disease Prevention & Health Promotion, 2010).

Further research by the Kindig, Panzer, and Nielsen-Bohlman (2004) found a causal relationship between low health literacy and health outcomes, and a correlation with health disparities. In 2011, Berkman, Sheridan, Donahue, Halpern, and Crotty synthesized the research and found that low health literacy was consistently associated with more hospitalizations, greater use of emergency care; lower receipt of mammography screening and influenza vaccine; poorer ability to take medications appropriately; poorer ability to integrate labels and health messages; and among elderly individuals, poorer overall health status and higher mortality rates.

Since the early 1990s, many ABE/ESOL programs throughout the United States have piloted the integration of health literacy education. During the last decade, a significant number of these initiatives have blossomed into citywide or statewide health literacy consortiums. Largely funded by community health foundations, these consortiums have spearheaded the integration of health literacy into ABE/ESOL programs while also educating health care organizations and practitioners about working with adults with limited literacy.

The early days of the broader health literacy field were dominated by defining and measuring health literacy and developing plain language materials. Fortunately, the definition of health literacy also evolved during the same time period. Currently, health literacy is understood to be individuals' understanding of the health care system, their own health, and the context within which they pursue or maintain wellness. Recently, an expanded definition points to a more inclusive, collaborative, and comprehensive approach to health literacy practice, emphasizing the role of culture, clear communications, and attention to existing knowledge about health in individuals' daily lives.

Starting in 1994, the state of Massachusetts took a leading role nationally for developing health literacy programs that embraced this evolving definition. For example, for more than 10 years, the state supported Comprehensive Health Projects through a participatory model (Hohn, 1998). Other special projects continued to affirm that ABE/ESOL classrooms were a good place to learn about health, including the breast and cervical cancer education programs at World Education (Boston) in the 1990s that produced curricula and teacher guidance. Projects in California, Iowa, New York, Texas, and Utah also developed comprehensive curricula, lesson plans, easy-to-read health books, and guides on integrating health. The majority of materials cited were catalogued in the Literacy Information and Communication System (LINCS) Health and Literacy Collection (https://lincs.ed.gov/resource-collection?keys=&field_rcis_topic_areas_value%5B%5D=Health+Literacy), which remains currently available. Zarcadoolas, Pleasant, and Greer (2006, p. 265) affirmed the value of developing health literacy in their book *Advancing Health Literacy*:

> ABE and ESOL classes are well suited to address and assess learners' individual needs. Literacy programs are an important environment in which to introduce and develop health literacy skills by infusing health into the literacy curriculum, effectively tailoring information to the students' health literacy abilities and real life needs.

Marcia Drew Hohn, EdD, is a Literacy and Health Consultant. Lorna Rivera, PhD, is an Associate Professor of Women's & Gender Studies, University of Massachusetts, Boston.

Address correspondence to Marcia Drew Hohn, EdD, Literacy and Health Consultant, 6 Pioneer Circle, Andover, MD 01810; email: mdrewhohn@aol.com.

Grant: L.R. reports a grant (P20MD002290) from the National Institute on Minority Health and Health Disparities of the National Institutes of Health.

Acknowledgment: The authors thank Winslow Holman (Notre Dame Education Center), an adult basic education instructor/resource counselor, for his contributions to the research process and his insights about students.

Disclosure: The authors have no relevant financial relationships to disclose.

Received: September 21, 2018; Accepted: March 19, 2019

doi:10.3928/24748307-20190325-01

A study about diabetes education in ESL classrooms by Santos, Handley, Omark, and Schillinger (2014) further affirmed the value of ABE/ESOL programs in developing health literacy among individuals with limited English. Project HEAL, an ABE-based breast and cervical cancer educational program conducted by World Education in the 1990s, also affirmed how tailoring information to students' literacy levels and life circumstances is an effective avenue in health literacy education (Open Door Collective, n. d.). Currently, impressive work in developing health literacy is being accomplished through the Chicago Citywide Literacy Coalition (http://www.chicagocitywideliteracy.com/programs/health-literacy/), which has a robust and long-standing program to integrate health literacy education into their literacy work. Koh and Rudd (2015) noted that the arc of health literacy work increasingly includes non-traditional venues for this education.

RESEARCH APPROACH

This study was undertaken to find out more about teaching/learning models and their impact on learners, teachers, and the program environment. With support from a grant from the National Institute on Minority Health and Health Disparities of the National Institutes of Health, this study investigated the following research questions:

1. What are effective models of delivering health information to ethnic minority communities with limited literacy?
2. How do these models compare in producing desirable changes in self-efficacy?
3. How do participatory models of developing health literacy compare to traditional models in their effectiveness in imparting health knowledge to adults with low literacy skills?

The participatory approach was defined as focusing on the priorities for learning identified by students, honoring existing knowledge and circumstances, using inclusive teaching methods, and promoting students as leaders in the teaching/learning process.

The students who participated in the study overwhelmingly classified themselves as Black, African American, or Latino. The students were between ages 18 and 35 years. Data were not available regarding the total enrollment of all students in the three programs for the 2 years because not all of the students enrolled in the programs were participants in the health literacy research study. A total of 90 adult learners were recruited and retained for the 2-year study. All 90 participants participated in the research by attending the health literacy ABE classes, completing surveys, and contributing to focus groups and individual interviews.

The health literacy classes met weekly during three 10- to 15-week cycles. The classes were taught by the regular classroom teacher with integrated reading, writing, and math activities. The three sites were located in the Roxbury neighborhood of Boston, an area where health disparities are disproportionately high:

- *Site 1: Community Health Center's ABE program.* This program served adult learners with higher literacy levels, a younger student population, and more U.S.-born ethnic minorities. The program taught health literacy for the first time.
- *Site 2: Roxbury House ABE program.* This program served adult learners with limited literacy levels, an older student population, and more immigrants. The program taught health literacy for the first time and emphasized student leadership.
- *Site 3: Women's Adult Education Program.* This program served only low-income women who were either formerly or currently homeless. The majority of participants were young mothers. The program provided access to many support services such as counseling, child care, and help with housing and jobs.

When we began our study, we did not expect that all three sites would choose to study healthy eating, but the common topic provided an enhanced opportunity to compare models for teaching and learning across the three ABE/ESOL programs.

OPERATION OF THE HEALTH LITERACY CLASSES

All of the programs elected to study healthy eating and had similar content in what they studied about nutrition, but the classrooms varied on emphasis and process, as well as the student population. For example, the GED and pre-GED classes focused more on searching for information on the Internet and identifying valid resources for information. One program emphasized helping students understand factors in their broader environment that impacted their health such as poor housing conditions, limited access to healthy food, and the prevalence of cheap, fast food. Other interests included the relationship of healthy eating to disease prevention and how food is processed in the body as it relates to weight control. Nevertheless, all three programs had common learning that promoted cross-program teaching and joint projects toward the end of the project in year 2.

Generally, the health literacy classes met once a week for several hours for four 15-week cycles. Although not all

students were in every cycle, students participating in the focus groups or individual interviews were required to have spent a significant amount of time in the health literacy classes. Students were paid a stipend for their participation in giving feedback. Stipends were given to the programs to cover teaching and planning time.

Specifically, the participants in the three sites learned about relevant body systems, the food pyramid and food groups, nutritional content and labeling, good and bad foods for health, portion control, exercise, and other factors important to health and weight control.

One of the most important activities of the research project involved researchers arranging periodic screenings through the Boston Health Van (http://www.familyvan.org/about-1) so learners could have vital information about their blood sugar/cholesterol and blood pressure over time and could recognize the importance of these screening services. The Boston Health Van made referrals for clinical services for participants with abnormal test results. Levels of blood pressure and sugar were found to be high, even among the younger students.

RECURRING THEMES FROM TEACHER-DIRECTOR INTERVIEWS

What Students Wanted to Learn About Health Was Rooted in the Realities of Their Everyday Lives

In two of the three programs, the health literacy teacher was also the program director, so this article does not distinguish between teacher and director perspectives. Teachers were first interviewed about the process they used for selecting topics for their health literacy classes. In general, this process began with asking the participants to discuss and identify (via brainstorming) health issues of personal concern. The learners then voted and decided as a group the most important issues they would investigate together in their health literacy class.

Teachers found that what ABE students wanted to learn about health was rooted in the realities of their everyday lives. The rates of obesity, diabetes, and hypertension were high among these learners and their families. Students had some awareness that nutrition was important in controlling these conditions and promoting their well-being, which motivated them to learn about healthy eating. Teachers were equally motivated to teach healthy eating because they observed poor eating habits, significant weight issues, and high absenteeism due to health problems. One teacher noted:

> As the counselor, I get to talk to students on a daily basis about some of the struggles they're going through day to day, health being one of the major struggles . . . if not a struggle with themselves, with a family that they, unfortunately, have to be out to take care of, or ship them back and forth . . . to and from appointments.

Teachers also gained insight into their own teaching processes. One teacher explained how she approached the health literacy classes in the beginning but found that she was:

> Doing research and trying to find, you know, the appropriate materials that are going to be relevant to them and interesting for them, and that's when I just like [think], "Oh my god, you know, I need to rely on them, you know?" We need to do this together in order to make it really work and make it meaningful.

The learning together approach also relieved the stress on teachers to be experts about health issues. The LINCS Literacy and Health Special Collection provides health education materials for all levels of ABE/ESOL learners across many health issues that students and teachers can explore together. In the case of healthy eating, there are also many community health organizations that provide teaching/learning programs on-site. For example, the Massachusetts Prevention Centers have teaching approaches and tools specially designed for low literacy that are used in ABE/ESOL programs. Teachers appreciated their hands-on approach. In addition, results from the mobile van's blood pressure and sugar level screenings reinforced the importance of teaching and learning about healthy eating for teachers.

Chronic Disease Was a Shocking Reality for Learners as Evidenced by Screenings

As evidenced by screening tests provided by the public health mobile vans, chronic disease was a shocking reality for learners. The following quotes illustrate this theme:

> When we had the Boston Public Health Commission come out and they did . . . the health screenings, they couldn't believe some of the results that come back. We had one student with hypertension issues right then and there . . . He had to be screened two more times before he left for the day . . . and then getting him an appointment [with a doctor] right away.

> We had several people . . . that truly benefited [from the health screening]. They didn't walk out without knowing, "Oh my goodness! My sugar levels are high or my blood pressure." . . . and it didn't stop there. They then came in to me, we sat down, we talked about what they were just told and how they can follow through . . . Go and schedule an appointment for yourself with your doctor. Where is your doctor? Do you even have a doctor? . . . We had a couple of students with no health insurance at all.

Teachers reported that some students developed prediabetes or diabetic conditions during their time in the ABE program as well as high blood pressure. Now they were more motivated to find out about diabetes, high blood pressure, and related outcomes such as heart attacks and stroke.

Teachers also observed changes in students' health behaviors. One teacher noted, "They constantly said that the one thing the class has done for them is allowed them to go into the stores and look at the labels now and make the choices they know are good for them."

Some teachers developed new awareness about approaches to broader health literacy education. One teacher said:

> The sad commentary is when [studying] particular communities – African-American communities and poor immigrant communities – they'll always find a report on data to demonstrate there is something lacking in the community . . . Now with health literacy you're able to make a difference in your life and your community's life . . . and [question] why there are higher levels of instances of asthma? Allergic reactions? And basically, you have this other group that comes over to respond, and they're giving you treatment that they are saying, "This is good for you," but no one seems to be giving you the means to say, "I can do for myself, I can make change for myself, I can do this."

Students Shared What They Learned With Other Students

Teachers reported that students enjoyed their new knowledge and enjoyed sharing what they learned in the health classes with other students. One counselor related how boxes of health teaching materials sitting in her office sparked a whole project:

> Two of the students from the GED class came in and . . . they wanted to see what I had, what new toys I had to play with. And I asked them if they were interested in helping me create a new Health Ed board out in the hallway . . . They designed the whole thing. They blew up a picture of the circulatory system [because] they thought it was very important for everyone to know and what the different food groups were and what the food pyramid was all about.

Other teachers found that students were engaging each other in debate and argued about smoking versus not smoking and how it would affect their hearts and their lungs. Another example involved food poisoning. When the students went into food preparation, they picked out types of food poisoning. Some of the students went into the computer lab and came up with descriptions on their own. They then explained these different types of food poisoning to the class. In fact, project-based learning and action projects were crucial reinforcements for cementing students' learning and increasing their self- and collective efficacy as well as their ability to see implications beyond themselves individually.

RECURRING THEMES FROM FOCUS GROUPS AND STUDENT INTERVIEWS

Value of Learning About Health in ABE Classrooms

Learning about health in ABE classrooms often was the first time that students:

- Gained awareness of the importance of health information
- Learned the necessary health vocabulary
- Had information presented in an understandable manner
- Felt safe to ask questions and speak out when they did not understand
- Considered the health information in the context of their lives

One student noted:

> I used to just eat anything, you know, and drink anything, and eat candies, and all this other stuff that wasn't good for me. But now . . . I see what certain types of food and things, certain types of ingredients that are in food can do to your body and stuff, and how it could affect you. I take that more into consideration, and I don't just eat anything now.

Learning over time with peers who have similar life circumstances reinforces learning. One participant said, "When you're doing it every day with a group, you could talk and you're having fun, you laugh, you make jokes, you watch a movie . . . I had fun. I will always remember it." Another participant noted that it was "really important that we did it all together, and you know, everybody was interested in it."

Being in a physically and psychologically safe and supportive environment also was critical to students' learning. Participants consistently stated that the ABE programs provided a safe and welcoming space to learn. Moreover, students' feelings of physical safety were significant given that the Roxbury/Dorchester neighborhoods have the city's highest crime rates (Wu, 2017, June). At one site, some of the participants had been incarcerated and were living in transitional housing where the programs offered even more psychological and social supports. Another ABE program was in a homeless shelter for women and children, many of whom were survivors of domestic violence; creating a climate and culture of peace was critical to this organization's mission and students' learning.

Self-Efficacy and Collective Efficacy

In the focus groups, students spoke extensively about how having knowledge and understanding of this important area of health brought a sense of power and control to their health

and their families' health. In the second year of the study, researchers pilot-tested a scale adapted from a German self-efficacy health scale (Schwarzer & Renner, 2000) to assess students' self-efficacy at the beginning and end of the cycle. However, students were bewildered by the scale because using scales was not in their experience, which rendered the results invalid. Moreover, the results were inconsistent both before and after administering the scales. As a result, measuring students' self-efficacy individually was discontinued. However, as reported in the focus groups, students clearly had increased levels of self-efficacy related to their health learning. For example, one participant said, "I . . . think if I wasn't in this health class and we talked about so much nutritional things and what was important to our nutrition, that I wouldn't have made changes."

The focus group findings also indicated that the majority of participants shared what they learned in their health literacy classes with their families, friends, and people in their communities. This likely increased their feelings of self-efficacy. One participant said:

> I stick to my diet and eat more fruits and vegetables, and more foods that have more value to my body . . . [I] even teach my family about nutritious food, and what is good to eat, and what is not good to eat.

Students felt really good about having information and new skills that afforded them more power and control over eating choices. However, through learning in a trusting group environment, an important new phenomenon emerged — collective efficacy — that appeared to greatly increase students' power and control to make real changes in their eating habits and those of their families. Collective efficacy seemed to have been generated within the social network of the ABE classrooms. Bandura (1994) defines collective efficacy as a group's shared beliefs in its capacities to organize and execute actions to produce desired goals. We define collective efficacy to mean when and how the group enhances feelings of power and control to be effective as individuals and as a group. As one teacher observed:

> They [the class] are like a family, and when they see one person paying attention or asking questions, then they want to pay attention and ask questions. So the group has given support and then from that support they feel stronger about getting up and just asking [about] issues on their own.

Group action projects and students teaching one another across programs seemed to have a particularly important impact. In the last cycle of the research, we asked programs to explicitly build action projects into the health classes to enhance this developing sense of collective efficacy. Action projects included PowerPoint® presentations to other students, cookouts where health class members shared healthy dishes and recipes, and making posters and other materials to share across programs.

The power of collective efficacy was apparent in the program, with a focus on helping students understand the impact of the environment on their health. One student made a particularly acute observation, "I didn't know what health disparities meant. I was actually living it, but I didn't know what it meant." Another student talked about her new awareness:

> When I learned about the word, health disparities, I wasn't really interested in it. I didn't really want to do it because I didn't even think how it affected me. I didn't even care; I was like "whatever." But when I started researching and looking at the community, and noticing that there was liquor stores on almost every corner in my neighborhood, there were all these abandoned lots and trash, I got really interested . . . I started like researching more and I loved it, like I still love it. Like, I'm so proud of the work that I did, and didn't even mind presenting it today.

Collective efficacy also embraced the teachers, and self- and collective efficacy reinforced one another. One teacher-director described that she was excited to join in this new health literacy initiative and that she entered into the process with great confidence and a fairly high level of self-efficacy. However, as the project continued and exploration deepened, she found her confidence waning. She began to feel like a hypocrite because she was overweight and generally did not take care of herself. It challenged her thinking about her role as a program director and as a facilitator of the health project:

> It was a humbling experience, which at first I fought against and beat myself up over. But what it did for me in the end was to give me a new, deeper sense and more genuine connection with the learners. It was an important lesson in the dangers of "power over" and the benefits of "power with" and the realization that we are indeed all in this together.

It may be the case that the adult learners who participated in the focus groups and interviews were already motivated to learn about health literacy, and they also may have been motivated to participate because cash stipends were offered for their participation in these research activities. Some of the participants were ordered by the court to participate in ABE classes; thus, there were different motivations for participation. However, additional data were gathered about student impact from the self-efficacy surveys, participant observation in classes, and interviews with program directors, counselors, and teachers; with this additional data, we were able to tri-

angulate our data and assess the positive impact on all participants.

A Surprising Finding

One of the research questions sought to determine whether teaching approaches in individual classrooms made a difference in student learning. Specifically, this question was: "How do participatory models of developing health literacy compare to traditional models in their effectiveness in imparting health knowledge to adults with low literacy skills?"

What we found was that it did not seem to matter if the teaching approach was more learner-centered than teacher-centered in individual classes. What did matter was the level of trust in the program between the staff and the students. There was a high level of trust within all three programs between the students and the teaching, counseling, and directing staff. For the learners, this is what seemed to matter rather than the specific teaching approach in the individual classrooms, which varied from highly teacher-controlled to highly participatory as students learned about healthy eating. Overall, the students trusted that the staff would listen to them, take their questions and concerns seriously, and work with them to make the learning experience useful in their lives.

However, we acknowledge that our research questions about the impact of participatory versus traditional approaches proved difficult to fully answer. Across the three different sites over 2 years, there was high turnover on the teaching staff, despite high retention among the adult learners. Only one of the programs had the same teacher leading the health literacy class for both years; therefore, we were unable to examine their pedagogy and study changes in teaching. We believe differences among the teachers' pedagogy, experience, and relationships with learners are critically important, and more research is needed to understand these differences. We continue to be inspired by Degener (2001), a researcher who presented a framework outlining the philosophy, goals, and activities that illustrates the range of learner-centered to teacher-centered approaches in ABE. According to Degener (2001, p. 34), two important differences from traditional approaches are "Using student experiences to frame the curricula" and "Students are active participants in creating the curriculum." Indeed, our research question about participatory versus traditional was difficult to measure because there were too many different variables to examine across the three program sites. For future studies, we will develop better assessment measures and address these limitations. We know that for at least three of the teachers, the findings support that they became more participatory in their teaching approaches; however, the limited number precludes this from being a specific finding.

SUMMARY

It is clear that ABE/ESOL programs are a good place for adults with limited literacy to learn about health. The programs provide a psychologically safe learning environment over time with staff skilled in adult learning, the opportunity for students to understand and engage with health information in the context of their everyday lives, and the support of classmates and teachers. These factors increase the likelihood that students will engage in healthier practices in their everyday lives.

It is equally clear that the ABE/ESOL system has a vital role to play in developing health literacy in its adult student population and connecting them to vital health services. This is one part of the solution to address the high level of health disparities among populations with limited literacy/limited English. This also has significant implications for policy development to increase health literacy education in ABE/ESOL programs and create opportunities for health and ABE/ESOL practitioners to work together in addressing a vital national issue (U.S. Department of Health and Human Services, Offices of Disease Prevention and Health Promotion, 2019).

What We Don't Know

We worked with 90 students in three programs for a 2-year period. Students who participated in the focus groups and interviews were excited to have this important new information for their everyday lives and reported many positive changes in their eating behaviors. However, we do not know how sustainable these changes have been. The students lived in "food deserts" where access to healthy, reasonably priced food was extremely limited and the prevalence of cheap, fast food was high. This is slowly changing in Boston, where there has been a concerted effort to bring supermarkets into low-income neighborhoods and to provide opportunities for residents to grow their own fruits and vegetables. It will be important for future studies to conduct follow-up interviews after 1 year with a selected cohort to assess whether the reported changes were sustained and to identify any major obstacles. Results from explicitly connecting students with community health services and developing partnerships with these organizations should also be explored.

REFERENCES

Bandura, A. (1994). Self-efficacy. In V.S. Ramachandran (Ed.), *Encyclopedia of human behavior* (pp. 71-81). New York, NY: Academic Press.

Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcomes: An updated systematic review. *Annals of Internal Medicine, 155*(2), 97-107. doi:10.7326/0003-4819-155-2-201107190-00005

Davis, T. C., Meldrum, H., Tippy, P., Weiss, B. D., & Williams, M. V. (1996). How poor literacy leads to poor healthcare. *Patient Care, 30*(16), 94-127.

Degener, S. (2001). Making sense of critical pedagogy in adult literacy education. *Annual Review of Adult Learning and Literacy, 2*, 26-62.

Hohn, M. D. (1998). *Empowerment health education in adult literacy*: *A guide for public health and adult literacy practitioners, policy makes and funders*. Retrieved from ERIC Institute of Education Services website: https://eric.ed.gov/?id=ED425342

Kindig, D. A., Panzer, A. M., & Nielsen-Bohlman, L. (Eds.). (2004). *Health literacy*: *A prescription to end confusion*. Retrieved from National Academies Press website: https://www.nap.edu/catalog/10883/health-literacy-a-prescription-to-end-confusion

Koh, H. K., & Rudd, R. E. (2015). The arc of health literacy. *The Journal of the American Medical Association*, *314*(12), 1225-1226. doi:10.1001/jama.2015.9978

Kutner, M., Greenberg, E., Jin, Y., Boyle, B., Hsu, Y., & Dunleavy, E. (2007). *Literacy in everyday life: Results From the 2003 National Assessment of Adult Literacy*. Retrieved from National Center for Education Statistics website: https://nces.ed.gov/Pubs2007/2007480_1.pdf

Open Door Collective. (n.d.). *Health literacy in ABE resources*. Retrieved from http://www.opendoorcollective.org/health-literacy-in-abe-resources.html

Ratzan, S. C., & Parker, R. M. (2000). Introduction. In C.R. Selden & M. Zorn, (Eds.), *National Library of Medicine current bibliographies in medicine: Health literacy*. Bethesda, MD: National Institutes of Health.

Santos, M. G., Handley, M. A., Omark, K., & Schillinger, D. (2014). ESL participation as a mechanism for advancing health literacy in immigrant communities. *Journal of Health Communication: International Perspectives, 19*(Suppl. 2), 89-105.

Schwarzer, K. & Renner, B. (2000). Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy. *Health Psychology*, *19*(5), 487-495.

U.S. Department of Health & Human Services, Office of Disease Prevention & Health Promotion. (2010). *National action plan to improve health literacy*. Retrieved from http://health.gov/communication/health-literacy-action-plan.asp

U.S. Department of Health and Human Services, Offices of Disease Prevention and Health Promotion. (2019). *Healthy people 2020*. Retrieved from https://www.healthypeople.gov/2020/about-healthy-people/how-to-use-healthypeople.gov/frequently-asked-questions

Williams, M. V., Baker, D. W., Parker, R. M., & Nurss, J. R. (1998). Relationship of functional health literacy to patients' knowledge of their chronic disease: A study of patients with hypertension and diabetes. *Archives of Internal Medicine, 158*(2), 166-172.

Wu, Y. (2017, June). Boston crime map: How safe is your neighborhood? *The Scope*. Retrieved from https://www.northeastern.edu/thescope/2017/06/21/boston-crime-map-how-safe-is-your-neighborhood/

Zarcadoolas, C., Pleasant, A. F., & Greer, D. S. (2006). *Advancing health literacy: A framework for understanding and action*. San Francisco, CA, Jossey-Bass.