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Health literacy and libraries: a literature review

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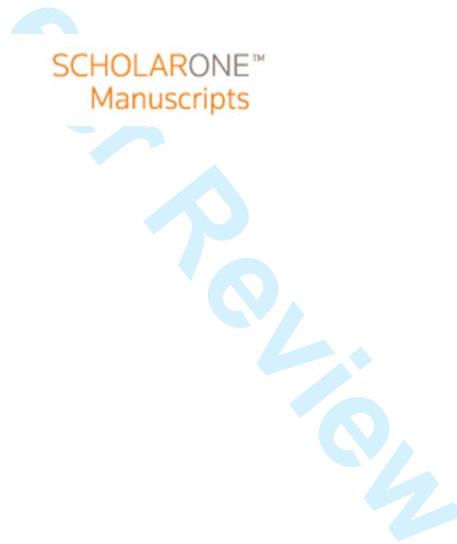
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Health literacy and libraries: a literature review

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Keywords:	health literacy, health information, information needs, consumer health, Librarianship, Libraries



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3 Health literacy and libraries: a literature review
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6 **Purpose**

7 The aim of this article is to assess the involvement of libraries in health literacy programs and
8 initiatives based on a review of the literature.
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11 **Methodology**

12 Four databases were searched for articles that described health literacy programs and initiatives
13 within libraries.

14
15 **Findings**

16 Several themes of health literacy programs in libraries emerged: health literacy for older adults,
17 underserved populations, the general public, healthcare professionals and medical students,
18 and patients. Collaborations between libraries and community organizations were frequently
19 utilized.
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22 **Practical implications**

23 Librarians may use this review to understand the history of health literacy efforts and libraries in
24 order to inform future programming. This review will contextualize current research on health
25 literacy and libraries.
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28 **Originality/value**

29 Despite the currency and relevance of this topic, there are no literature reviews on health
30 literacy and librarianship.
31

32
33 **Keywords**

34 health literacy, health information, information needs, consumer health, libraries, librarianship
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37 **Paper type**

38 Literature review
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41 **Introduction**

42 The health of up to 90 million Americans may be at risk because of their inability to
43 understand and act upon health information (Kutner et al., 2006; Nielsen-Bohlman et al., 2004;
44 U.S. Department of Education, 2013; U.S. Department of Health and Human Services, Office of
45 Disease Prevention and Health Promotion, 2008). Health literacy initiatives from leading
46 organizations brought this issue into the spotlight and created a growing recognition of health
47 literacy as a valid subject of research. Librarians have been involved in the field of health
48 literacy since its inception, contributing through research, teaching, and programmatic efforts.
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57 Despite the prevalence of recent scholarship and its topical nature, there are no literature
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3 reviews on health literacy and librarianship. The aim of this article is to assess the involvement
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5 of libraries in health literacy projects and initiatives based on a review of the literature.
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8 9 *What is health literacy?*

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11 Health literacy is defined as the degree to which individuals have the capacity to obtain,
12
13 process, and understand basic health information and services needed to make appropriate
14
15 health decisions (U.S. Department of Health and Human Services, 2000). There are a variety of
16
17 measurements used to gauge health literacy, but the results are typically categorized as
18
19 proficient, intermediate, basic, and below basic. The terms limited or low health literacy are
20
21 often used to describe rates of health literacy below proficient. Individuals with limited health
22
23 literacy cannot be expected, for example, to understand basic medical concepts after reading
24
25 clearly written pamphlets (Kutner et al., 2006). According to current estimates, anywhere from
26
27 36 to 90 million Americans experience limited health literacy (Kutner et al., 2006; Nielsen-
28
29 Bohlman et al., 2004; U.S. Department of Health and Human Services, Office of Disease
30
31 Prevention and Health Promotion, 2008.). In the National Assessment of Adult Literacy study,
32
33 36 percent of participants had basic or below basic health literacy skills (Kutner et al., 2006).
34
35 Findings from the 1992 National Adult Literacy Survey (NALS), 2003 National Assessment of
36
37 Adult Literacy (NAAL), and the 2012 Program for the International Assessment of Adult
38
39 Competencies (PIAAC) show that adult literacy skills have changed relatively little over time. In
40
41 2003, NAAL demonstrated that only 12 percent of adults had proficient health literacy skills
42
43 (Kutner et al., 2006). Almost ten years later, the PIAAC data showed similar patterns: only 12
44
45 percent of adults showed the highest proficiency level on literacy tasks and 9 percent showed
46
47 proficient numeracy skills (U.S. Department of Education, 2013).
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52 These findings are important within a public health context, considering research that
53
54 shows associations between low health literacy and poor health outcomes (Berkman et al.,
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56 2011). Low health literacy is associated with more hospitalizations, greater use of emergency
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3 care, and poorer ability to demonstrate taking medications appropriately and interpret labels and
4 health messages, and it partly explains racial disparities in a variety of outcomes (Berkman et
5 al., 2011). In older adults, low health literacy is associated with worse overall health status and
6 increased mortality (Berkman et al., 2011). These findings are especially relevant to NAAL data
7 which shows that adults with below basic health literacy (the lowest designation) were more
8 likely to be age 65 or older (Kutner et al., 2006).
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16 Several organizations have created initiatives dedicated to improving health literacy.
17 Health literacy was identified as a priority by the Department of Health and Human Services'
18 "Healthy People 2020" in 2000, the Institute of Medicine's "Prescription to End Confusion" in
19 2003, and most recently in the National Action Plan by the Office of Disease Prevention and
20 Health Promotion in 2010. A health literacy bibliometric analysis showed a clear upward growth
21 pattern of published literature on this topic after 2003, suggesting that health literacy initiatives
22 undertaken by the Institute of Medicine (IOM), the American Medical Association, and the
23 Medical Library Association (MLA) around this time may be partly responsible for this trend
24 (Bankson, 2009). More recently, the "Health Literacy" MeSH subject heading was added in
25 2010, and in a PubMed search for articles whose titles contained the phrase "health literacy", 20
26 percent were published in the past year. The proliferation of recent research on this topic has
27 resulted in the creation of tutorials and toolkits for healthcare professionals as well as new
28 frameworks for integrating health literacy into practice (CDC, 2014; National Patient Safety
29 Foundation, 2016).
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48 *Health literacy and libraries*

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50 The Medical Library Association has expanded the current definition of health literacy by
51 defining health information literacy as "the set of abilities needed to: recognize a health
52 information need; identify likely information sources and use them to retrieve relevant
53 information; assess the quality of the information and its applicability to a specific situation; and
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3 analyze, understand, and use the information to make good health decisions” (Kars et al.,
4 2008). MLA calls on librarians in all types of libraries to play a major role in health literacy by
5 helping consumers access and understand health information (Kars et al., 2008). Theoretical
6 and research-based explorations of the ways that people experience health literacy, including a
7 recent study that used a phenomenographic approach, indicate the continued interest and
8 importance of health literacy within librarianship (Yates, 2015). Librarians are perfectly
9 positioned to contribute to the health literacy movement as keepers of information, teachers and
10 champions of information literacy, and liaisons to researchers and healthcare professionals who
11 strive to improve health literacy. It is important for librarians to understand the history of health
12 literacy research, including previous efforts to implement health literacy programs in libraries, in
13 order to inform such efforts in their own organizations.
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30 **Methods**

31 Four databases were searched: Library Literature, Library, Information Science &
32 Technology Abstracts (LISTA), PubMed, and Web of Science. Database searching took place
33 on December 1, 2015 with an update on January 28, 2016. Databases were searched using
34 broad keywords to ensure that a large number of results were found. Keywords included "health
35 literacy", library, and librarian. The vast majority of results focused on libraries in the United
36 States and Canada; for this reason, this review focuses solely on health literacy and libraries
37 within a North American context.
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49 **Results**

50 Published literature on health literacy efforts within librarianship has increased since the
51 identification of this issue as a national healthcare priority in the early 2000s (Bankson, 2009).
52 Libraries of all kinds have created educational programs, fostered partnerships with health and
53 community organizations, and used innovative outreach methods to reach their user
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3 populations. Health literacy programs in the published library literature include efforts involving
4
5 the following populations: older adults, underserved groups, the general public, healthcare
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7 professionals and students, and patients. Collaborative efforts between libraries and other
8
9 organizations are also explored.
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11 12 13 *Older adults*

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15 Older adults are particularly at risk for low health literacy which is associated with poor
16
17 health outcomes (Kutner et al., 2006). Public libraries have a long tradition of outreach and
18
19 service to this user population, and incorporating health literacy efforts into programming for
20
21 older adults is a logical solution. Many of the health literacy efforts conducted in public libraries
22
23 involve workshops and classes for older adults in the use of consumer health databases. Public
24
25 librarians in Louisiana, for example, conducted classes for older adults based on the
26
27 NIHSeniorHealth Toolkit for Trainers (Susic, 2009). Librarians at a large, urban public library in
28
29 Maryland held collaborative, hands-on computer classes whose curriculum was based upon this
30
31 toolkit as well (Xie, 2011). Based on pre- and post-test measurements, e-health literacy efficacy
32
33 improved after the training, as did participants' perceptions of the internet as a useful and
34
35 important tool for health-making decisions (Xie, 2011). A variety of studies examining learning
36
37 styles at workshops for older adults at public libraries in Maryland have been conducted by Xie
38
39 (2011, 2012). In one specific study, two public libraries provided workshops for older adults led
40
41 by MLS students that focused on training in the use of MedlinePlus and NIHSeniorHealth
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43 databases (Xie, 2012). Post-test surveys revealed significant decreases in the levels of
44
45 computer anxiety, and over 75 percent of participants reported that the workshop impacted their
46
47 health decision-making (Xie, 2012).
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52 While public libraries are a natural fit for outreach to older adults, academic libraries
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54 have also provided these services successfully, often with the aid of partnerships within local
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56 communities. SeniorCHAT was a program focused on consumer health awareness training to
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3 older adults in Louisiana (Strong et al., 2012). In collaboration with local senior centers,
4
5 academic librarians provided hands-on workshops that trained senior citizens in the use of
6
7 MedlinePlus and NIHSeniorHealth databases and created a corresponding LibGuide (Strong et
8
9 al., 2012). Survey and anecdotal data revealed that participants felt empowered by the
10
11 computer training and their use of these databases had increased (Strong et al., 2012). The
12
13 Health Literacy Program for Minnesota Seniors was a two-part workshop series that focused on
14
15 communication with healthcare providers and seeking health information on the internet
16
17 (Aspinall et al., 2012). This evidence-based program combined health literacy and health
18
19 information literacy interventions into one curriculum and was delivered by academic librarians
20
21 to residents at a local senior living community (Aspinall et al., 2012). Another collaboration
22
23 between academic libraries and senior centers resulted in workshops for seniors on finding and
24
25 evaluating health information online (Wu et al., 2006). “Healthy aging resources on the web” is
26
27 an example of a successful collaboration by a public library and an academic library (Marhenke
28
29 & Howrey, 2014). This partnership led to the creation of several workshops for older adults
30
31 including training on free e-health online resources and National Library of Medicine (NLM)
32
33 databases and choosing health insurance (Marhenke & Howrey, 2014). Surveys of participants
34
35 showed an increase in self-efficacy for searching for and evaluating health information online
36
37 (Marhenke & Howrey, 2014). A partnership between academic librarians, a senior clinic, and a
38
39 senior community center resulted in the implementation of workshops for older adults on NLM
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41 databases and the creation and maintenance of an online portal related to senior health
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47 (Broering et al., 2006).

48 49 *Underserved populations*

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52 While there are many different definitions of underserved or vulnerable populations,
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54 these populations are typically defined as groups with a higher risk of diseases due to certain
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56 socio-economic factors and other social determinants of health. Examples of underserved
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3 populations can include low-income individuals, racial and ethnic minorities, and refugees, to
4 name a few. Because underserved populations disproportionately suffer from low levels of
5 health literacy, special efforts are often made to target these groups for library outreach. A
6 survey of school and public librarians about attitudes toward health literacy outreach for
7 underserved groups in rural Texas found broad support for community outreach programs for
8 underserved groups by librarians (Lukenbill & Immroth, 2009). Although respondents displayed
9 less support for librarians acting as gatekeepers of health information, several collaborative
10 outreach programs have shown that librarians have been successful in this role (Lukenbill &
11 Immroth, 2009). Public librarians surveyed about their service to underserved populations
12 reported several potential barriers in providing health information to these users such as not
13 knowing where to look for clearly written, up-to-date health information, fear of misinterpreting
14 health questions, and the low level of users' reading or learning ability that may prevent them
15 from understanding complex medical concepts (Mi et al., 2014).
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31 Recent immigrants have special needs related to health literacy; not only may English
32 literacy skills be lacking, but cultural attitudes that influence health beliefs may not align with the
33 American health care system (Allen et al., 2004). Librarians in Wisconsin promoted health
34 literacy among Hmong immigrants in their area by exhibiting at health fairs and conferences,
35 training providers on databases that provided culturally relevant health information, and creating
36 a website featuring Hmong health topics (Allen et al., 2004). The library was also involved in the
37 translation of health information pamphlets and the production of educational videos on a variety
38 of health topics (Allen et al., 2004). Each of these efforts was tailored to the Hmong population
39 by using culturally relevant images and language that this group would relate to (Allen et al.,
40 2004). Patient acceptance of these materials was excellent, and use of the website was good
41 (Allen et al., 2004). In New York, librarians and healthcare workers worked with Somali Bantu
42 refugee groups to learn about their health information needs; this needs assessment resulted in
43 the design of a health education curriculum delivered to refugees during home visits
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3 (Eisenhauer et al., 2012). In both of these projects, collaborations with local providers and
4
5 healthcare workers were sought in order to raise awareness among healthcare professionals of
6
7 the health information needs of the immigrant populations (Allen et al., 2004; Eisenhauer et al.,
8
9 2012).
10

11
12 Librarians in Montana designed a unique health literacy program for inmates in a county
13
14 detention center (Kouame & Young, 2014). Incarcerated adults experience worse health
15
16 outcomes and lower levels of health literacy than the normal population, making them an ideal
17
18 choice for health literacy outreach (Kouame & Young, 2014). Because inmates did not have
19
20 access to live internet sites, an “internet in a box” was created with content from MedlinePlus
21
22 and other health information sources that simulated the experience of searching for online
23
24 information on a variety of health topics (Kouame & Young, 2014). In addition to receiving health
25
26 information, participants learned how to use these databases in order to replicate the
27
28 experience of searching in the future (Kouame & Young, 2014). Educational materials on health
29
30 topics like stress, drug abuse treatment, and provider communication were also provided
31
32 (Kouame & Young, 2014). Surveys showed improvements in computer skills and confidence in
33
34 understanding the healthcare system (Kouame & Young, 2014).
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39 Underserved patient populations, especially uninsured patients, are a hard to reach
40
41 population with potentially low health literacy. To address the unique needs of this group, a
42
43 medical library in Tennessee utilized a pictorial touch-screen kiosk that displayed several
44
45 image-based tutorials on a variety of health topics (Teolis, 2010). The tutorials were based on
46
47 information from MedlinePlus that had been converted into easy-to-read modules for non-
48
49 English speakers and users with low health literacy (Teolis, 2010). Most participants were first-
50
51 time MedlinePlus users, indicating that this service identified a need for information that was
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53 previously unfulfilled (Teolis, 2010).
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57 *The general public*
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Public libraries are perfectly positioned to provide health literacy education to members of the general public. Despite the potential pitfalls of wading into political controversy, many public libraries have been involved in efforts to educate their patrons about the Affordable Care Act (Malachowski, 2014; Real et al., 2015). The creation of health information portals for the public is another important health literacy effort, especially when these portals address barriers to the access, comprehension, and use of health information (Austvoll et al., 2013; Radick, 2015). Consumer health centers in public libraries are another potential place for health literacy outreach to local communities. At these centers, librarians help patrons search for and understand health information and provide health materials. A survey of public library patrons about a consumer health center in Virginia revealed a lack of knowledge about the center and an interest in utilizing this resource in the future (Ports et al., 2015). Despite its underuse, the overwhelmingly positive feedback about this resource from patrons that had used its services indicated its potential value in the library (Ports et al., 2015).

Many published articles that highlight health literacy efforts to the general public focus on collaboration between public libraries and other organizations. Public libraries may be better positioned to leverage partnerships with community organizations than other types of libraries which may explain why many of the following examples feature these types of collaborations. Public libraries have often utilized the expertise of the National Library of Medicine in training librarians to find health information and increase the health literacy skills of patrons. Librarians report increased confidence and proficiency in finding health information from a variety of sources after attending such workshops (Noh, 2013; Radick, 2015; Sandstrom, 2004). A recent project by the National Network of Libraries of Medicine, New England Region (NN/LM NER), trained public librarians to use MedlinePlus; these librarians were able to then teach these skills to their patrons (Radick, 2015). The training that resulted from this project reached over half of the libraries in New Hampshire (Radick, 2015). Public libraries in New York have also worked

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3 with NN/NLM to train librarians on NLM database instruction and community health outreach
4
5 using these resources (Radick, 2015).
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8 Health literacy efforts involving partnerships between academic and public libraries have
9
10 also been successful. Academic librarians in Massachusetts collaborated with a local public
11
12 library to offer monthly classes that instructed members of the public on finding reliable health
13
14 information on MedlinePlus (Malachowski, 2011). Although these classes received positive
15
16 feedback from participants, they experienced low enrollment (Malachowski, 2011). “Train the
17
18 trainer” classes that resulted from a collaboration of academic and public libraries educated
19
20 public librarians on mental health resources intended to increase awareness of the importance
21
22 of teaching mental health literacy to library patrons (Radick, 2015). One innovative initiative
23
24 called the Health Information Fellowship allowed public librarians to obtain a Consumer Health
25
26 Information Specialist certificate from MLA with the help of local hospitals and healthcare
27
28 centers which were integrated into the curriculum (Zionts et al., 2010). The newly expert
29
30 librarians created many health literacy efforts such as a consumer health portal, a staff training
31
32 module, and a workshop for patrons about preparing for medical visits (Zionts et al., 2010).
33
34 Librarians that participated in this program reported increased familiarity with consumer health
35
36 information resources and increased ability to direct patrons to appropriate online health
37
38 information resources (Zionts et al., 2010). The Delaware Health Source, another collaborative
39
40 effort, employed consumer health librarians through a partnership between the public library, the
41
42 local health department, and the Delaware Academy of Medicine (LaValley, 2009). These
43
44 librarians worked at public libraries and served users throughout the state through consultations,
45
46 workshops, exhibits at health fairs where they raised awareness and provided resources related
47
48 to finding health information (LaValley, 2009). One unique partnership with a local law center
49
50 resulted in a public workshop about advance directives involving rights, responsibilities and
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52 decision-making while a collaboration with children’s librarians led to a wellness program that
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54 educated kids and parents about healthy living choices (LaValley, 2009). Librarian involvement
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3 with a Mini-Med School program, a series of lectures by medical faculty presented to a local
4 public audience, resulted in the incorporation of tools to search and evaluate online health
5 information into this program (Van Moorsel, 2001).
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10 *Healthcare professionals and students*

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13 Health literacy efforts often go beyond educating consumers and target healthcare
14 professionals and students in the health sciences field. These efforts aim to increase the level of
15 understanding between healthcare providers and patients and, in the form of outreach to
16 students, educate the future healthcare workforce. In a study that examined the perceived
17 importance of health literacy efforts in healthcare settings, hospital administrators and
18 healthcare providers reported the necessity of increasing awareness about the barriers to health
19 literacy and its impact on patient care by training healthcare professionals (Shipman et al.,
20 2009).
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31 Medical librarians working in healthcare settings are often at the forefront of health
32 literacy awareness efforts for healthcare professionals and students. Online tutorials and in-
33 person workshops for physicians, nurses, medical residents, and students have focused on
34 understanding the needs of health literacy-challenged patients, screening for health literacy,
35 awareness of consumer health resources, and demonstrating communication strategies to
36 utilize in practice including plain language and active listening (Crampton et al., 2010;
37 Macdonald, 2015; Shipman et al., 2009; Szwajcer et al., 2014; Wickline & Rosenthal, 2010).
38
39 Healthcare professionals that have participated in such workshops reported increased
40 understanding of health literacy issues and interest in using strategies like plain language
41 (Crampton et al., 2010; Shipman et al., 2009; Szwajcer et al., 2014). Health literacy programs in
42 medical libraries have also highlighted the need to refer patients to librarians for further
43 information and used displays to reach medical students (Shipman et al., 2009, Wickline &
44 Rosenthal, 2010).
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3 A notable health literacy initiative is the Plain Language Program at Massachusetts
4 General Hospital (Paul & Schneider, 2006). This program consisted of librarian-led workshops
5 for hospital staff that used examples of current hospital documents to illustrate the need for plain
6 language and demonstrate strategies for writing and evaluation (Paul & Schneider, 2006).
7
8 These workshops led to collaborations with researchers, nurses, and interpreters that resulted
9 in plain language usage in hospital informed consent forms and patient education materials
10 (Paul & Schneider, 2006). In another instance of library and researcher collaboration, librarians
11 at the University of Maryland offered workshops for researchers about patient literacy and
12 informed consent (Raimondo, 2014). This led to the development of a review service for IRB
13 informed consent forms that aimed to simplify the language used for ensured participant
14 understanding (Raimondo, 2014). Users reported satisfaction with the service and positive
15 changes regarding simplified language on informed consent forms (Raimondo, 2014). An
16 innovative health literacy course at Harvard Medical School paired medical students with adult
17 learners in order to illustrate the importance of plain language use in real-world patient
18 encounters (Hess & Whelan, 2009). A similar assignment given to undergraduate health
19 sciences students at James Madison University illustrated the concepts of plain language and
20 cultural health beliefs by placing students in the role of health information-seeking patients
21 (McCabe, 2006).
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43 *Patients*

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45 The health information literacy needs of patients have been described in four broad
46 categories: consumer health information, informed consent, information literacy, and critical
47 thinking techniques (Cullen, 2005). Medical librarians have designed health literacy efforts
48 focused on each of these needs using traditional and nontraditional approaches. Health literacy
49 outreach to patients is traditionally delivered by medical librarians via hospital or consumer
50 health libraries in the form of training on the use of medical databases and consultations about a
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3 variety of health topics (Burnham & Peterson, 2005; Duhon & Jameson, 2013; Neal & Brower,
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5 2013). A survey of academic health sciences libraries revealed that 86 percent of libraries
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7 affiliated with hospitals or medical centers reported participating in health information outreach,
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9 compared to 49 percent of academic libraries unaffiliated with healthcare centers and 28
10
11 percent of general academic libraries (Duhon & Jameson, 2013). Because of their proximity to
12
13 clinical environments, hospital libraries have a unique opportunity to provide patient bedside
14
15 delivery of information, facilitate partnerships with clinical staff like nurses, social workers and
16
17 residents, and participate in outreach activities such as patient information rounds, health
18
19 education lectures, and health fairs (Duhon & Jameson, 2013; Oelschlegel et al., 2014; Vaughn
20
21 et al., 2014). Online portals containing health information are another health literacy effort for
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23 patients which require librarian involvement, both in the provision and curation of content and in
24
25 addressing barriers involving patients' ability to find and evaluate information within the portal
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27 (Jurczyk, 2012).
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32 There are several examples of novel health literacy efforts that expand the traditional
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34 role and services of hospital librarians. A program at the University of Florida placed librarians in
35
36 a university clinic in order to assist patients with finding health information and formulating
37
38 questions about their health concerns to communicate to their healthcare providers (Butson &
39
40 Pauly, 2013). Questions were created that related to areas of disease/diagnosis, medications,
41
42 symptoms, treatment, support, nutrition, and lab tests, indicating information needs in each of
43
44 these areas (Butson & Pauly, 2013). Most patients expressed satisfaction with the librarian's
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46 assistance in finding information and developing questions, indicating the potential value of this
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48 service (Butson & Pauly, 2013). Many health literacy efforts have been implemented at Preston
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50 Medical Library in Tennessee, including the recent use of the hospital's in-room television
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52 service for patients to request health information (Vaughn et al., 2014).
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56 *Collaborations*

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3 Collaborations with community organizations are often essential for libraries planning
4 health literacy efforts, especially when targeting hard to reach populations. Libraries working
5 with older adults have collaborated with senior centers and senior living facilities, while libraries
6 targeting underserved populations have collaborated with prisons, homeless shelters, public
7 health departments, and other community health organizations. One creative method of
8 community outreach involved a librarian working with local hair salons to advertise library
9 programs and distribute health literacy educational materials (Radick, 2015). Another outreach
10 program partnered a medical librarian with a baptist church to provide hands-on health literacy
11 workshops which focused on health issues that were relevant to the community (Stephenson et
12 al., 2004). Collaborations between hospital, academic, and public libraries have resulted in
13 health literacy outreach activities to a variety of users, and many of these efforts are detailed
14 earlier in this review.
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29 The GetHELP health literacy program is an example of a multifaceted collaborative effort
30 between librarians, healthcare professionals, and community organizations that resulted in
31 increased health literacy awareness among librarians, healthcare workers, and the public
32 (Jacobson, 2008). "Train the trainer" classes prepared librarians in a variety of settings to serve
33 low-income residents of a Washington county (Jacobson, 2008). Librarians from public libraries,
34 community college libraries, and medical libraries were trained on health literacy issues and
35 finding health information in order to provide these services to their patrons, and a collaborative
36 referral system was developed for complex health questions to be forwarded to experienced
37 medical librarians (Jacobson, 2008). Similarly, "train the trainer" classes were designed for local
38 healthcare professionals including community health workers, hospital employees, and public
39 health workers (Jacobson, 2008). Finally, public classes that focused on finding health
40 information, communicating with providers, and personal organization and responsibility in
41 health records were held at community senior centers (Jacobson, 2008). Few other
42 comprehensive collaborative efforts like this exist, but there are many health literacy efforts,
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3 including several noteworthy collaborative projects in Tennessee (Quesenberry, 2015;
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5 Stephenson et al., 2004) involving collaborations with community organizations that operate on
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7 a smaller scale.
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10 There are several examples of partnerships between libraries and other organizations to
11 improve health literacy among adolescents. Librarians at a university in Massachusetts
12 developed a health information curriculum for students at a local elementary school that
13 introduced students to the concept of health information literacy with the help of interactive
14 activities facilitated by PharmD students (Friel, 2015). In five sessions, students were instructed
15 on the concept of health information literacy and the use of MedlinePlus to find and evaluate
16 health information (Friel, 2015). Surveys showed increased awareness of MedlinePlus as an
17 online health information resource and increased knowledge of evaluating reliable health
18 information sources (Friel, 2015).
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29 An important component of collaborative projects is the support of the targeted
30 population. A collaborative project called Health Information @ Preuss aimed to integrate
31 guidance for online health information-seeking into a middle school curriculum (Haynes, 2004).
32 The accomplishment of this integration was partly accountable to the relationships formed with
33 school administrators before the submission of the project proposal. Ensuring the school
34 administration's support for the project facilitated faculty buy-in and ownership which was
35 evidenced by faculty members volunteering to teach health literacy in their classes and the
36 inclusion of a health literacy training session for faculty during an in-service day (Haynes, 2004).
37 Students and faculty gave positive feedback about the training sessions and reported increased
38 awareness of reliable online health information sources (Haynes, 2004). Taking collaborative
39 projects one step further in involving the target population, a project called Healthflicks sought
40 input from teenagers when designing peer-to-peer health literacy videos for teens (Greenberg &
41 Wang, 2012). Librarians recruited high school students to participate in a two-day workshop
42 about health literacy, and these students worked with a university student mentor to create short
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3 videos on a variety of health topics of interest to them (Greenberg & Wang, 2012). Buy-in from
4 students and teachers not only increased ownership of the project and relevance to local
5 concerns but ensured its sustainability in the future (Greenberg & Wang, 2012).
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10 Collaborations between libraries and public health departments have led to fruitful health
11 literacy programs. The Library Nurse Project placed public health nurses into public libraries in
12 Arizona (Malkin & Feingold, 2014). The nurses presented educational sessions on health and
13 safety topics, many of which had been identified as unmet health needs by the patron
14 population (Malkin & Feingold, 2014). In rural Maine, librarians, teachers, and public health
15 workers collaborated on the integration of a health literacy curriculum into local schools which
16 resulted in increased knowledge of online health information resources among students and
17 teachers involved in the program (Kurtz-Rossi & Duguay, 2010). A collaborative partnership
18 made up of librarians, public health workers, and healthcare providers led to the formation of a
19 coalition called Health Information Partners (Pomerantz et al., 2010). This coalition held
20 outreach activities to increase health literacy in local communities including training sessions for
21 online health information finding, distribution of health information to local neighborhoods, and
22 other outreach and community health advocacy activities (Pomerantz et al., 2010). Evaluations
23 of the health literacy training sessions revealed that less than half of participants had used the
24 internet and only 1 out of 52 participants had used the internet to find health information; these
25 training sessions provided access to a heretofore unknown source of knowledge for this
26 population and empowered participants to use this resource (Pomerantz et al., 2010). Building
27 relationships with schools, public health departments, healthcare centers, and adult education
28 providers was key to the program's success (Pomerantz et al., 2010).
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51 **Discussion**

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54 Although this review identified a variety of types of libraries that participated in health
55 literacy efforts, several gaps remain in the literature. School librarians have a unique opportunity
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3 to improve the health literacy of children and teachers, but these libraries are underrepresented
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5 in the literature. Community college libraries are well-positioned to reach nontraditional
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7 students, older adults, and underserved groups that use their services; unfortunately, health
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9 literacy efforts in these libraries were also absent from the literature. Collaborations between
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11 academic libraries and university health services were not present in the literature; this
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13 partnership has many potential advantages, including outreach to students who may not visit
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15 the traditional library space. More research is needed on health literacy efforts in these
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17 environments, and librarians in these types of libraries should be encouraged to share
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19 successful programs in the published literature.
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23 One area of potential improvement for libraries providing health literacy programs is the
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25 measurement of the impact of library efforts. Assessment, including the identification and
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27 measurement of outcomes, is often an afterthought of library programs, and previous reviews of
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29 library outreach efforts have highlighted weaknesses in the quality of measurement, analysis,
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31 and design (Whitney, 2013). The most common form of evaluation for health literacy programs
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33 in libraries remains the pre- and post-test survey that uses self-report to gauge impact and
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35 effectiveness (Aspinall et al., 2012; Kouame & Young, 2014; Strong et al., 2012; Xie, 2011).
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37 While this method can be useful for pilot studies, more robust methods of assessment should be
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39 considered, including significance testing, systematic thematic analysis, and measuring long-
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41 term outcomes or impact. Utilizing such methods may be challenging for librarians who deliver
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43 one-shot sessions; for this reason, integration of health literacy into all library services is ideal in
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45 order to measure comprehensive impact.
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49 Partnerships with community groups should not be overlooked when creating health
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51 literacy efforts. Many successful collaborative programs were facilitated by NLM grants that
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53 encouraged partnerships between libraries and community organizations (Allen et al., 2004;
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55 Aspinall et al., 2012; Crampton et al., 2010; Haynes, 2004; Jacobson, 2008; Kouame & Young,
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57 2014; Malachowski, 2011; Marhenke & Howrey, 2014; Paul & Schneider, 2006; Radick, 2015;
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3 Strong et al., 2012; Wu et al., 2006). Librarians should consider forming similar partnerships
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5 when designing health literacy efforts.
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9 10 **Conclusion**

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12 Innovative health literacy efforts can be found in many types of libraries that serve a
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14 variety of users. There is no standard health literacy library program, but most involve
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16 instruction in health information-seeking and critical evaluation of online sources. Workshops for
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18 patrons and “train the trainer” classes have been implemented in a variety of settings, and
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20 feedback has been consistently positive from all participant groups. Given the importance of this
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22 issue to national health priorities, librarians will continue to be involved in the promotion of
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24 health literacy by spearheading efforts and initiatives to their local user populations. Librarians
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26 involved in health literacy efforts should consult the published literature when designing new
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28 services and reporting on successful efforts; engaging with the evidence base will ensure the
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30 continued success of health literacy efforts in libraries.
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