

January 2014

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Van M. Ta Park
San Jose State University, van.ta@sjsu.edu

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Recommended Citation

Van M. Ta Park. "Text 4 Health: Addressing Consumer Health Information Needs via Text Reference Service" *Reference and User Services Quarterly* (2014): 326-333.

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Text 4 Health

Addressing Consumer Health Information Needs via Text Reference Service

Lili Luo and Van Ta Park

Lili Luo (*lili.luo@sjsu.edu*) is Associate Professor, School of Library and Information Science, and Van Ta Park (*van.ta@sjsu.edu*) is Associate Professor, Department of Health Science and Recreation, San Jose (CA) State University.

This study seeks to provide empirical evidence about how health-related questions are answered in text reference service to further the understanding of how to best use texting as a reference service venue to fulfill people's health information needs. Two hundred health reference transactions from My Info Quest, the first nationwide collaborative text reference service, were analyzed to identify the types of questions, length of transactions, question-answering behavior, and information sources used in the transactions. Findings indicate that texting-based health reference transactions are usually brief and cover a wide variety of topics. The most popular questions are those seeking general factual information about the human body, medical/health conditions, diseases, or medical concepts/jargons. Great variance is discovered between the question-answering behavior, with only a little more than half of the answers containing a citation to information sources. The study will inform the practice of health reference service via texting and help libraries make evidence-based decisions on establishing service policies and procedures, providing training for librarians, and ultimately implementing the service successfully.

Note: In this paper, transcriptions of text reference questions are entered verbatim, without attempt to correct spelling or grammar.

Health literacy is 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.”¹ According to the Institute of Medicine, nearly half of all American adults, about 90 million people, have difficulty understanding and using health information, and the nation's poor health literacy has been characterized as public health's “silent epidemic.”²

Poor health literacy can negatively affect a significant array of health outcomes, resulting in inappropriate use of health services, risk of hospitalization, lack of health screening, misunderstanding of one's disease, and inability to manage chronic illnesses like hypertension and diabetes.³ To enhance health literacy among the public, organizations like the Institute of Medicine, the National Library of Medicine, and the US Department of Health and Human Services (USDHHS) have identified health literacy as a national health and public policy priority.⁴

Texting, as a popular communication venue, has been employed by health educators and health care professionals to promote health literacy and disseminate health information. An

Reference & User Services Quarterly,
vol. 53, no. 4, pp. 326–33
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increasing number of health texting and mobile health programs are being implemented. In 2010, the USDHHS established the Text4Health Task Force to actively explore means to capitalize on the rapid proliferation of mobile phone technology and platforms, such as texting, to develop programs and partnerships with the aim of improving public health outcomes.⁵ Studies have shown that people find texting-based health promotion and intervention effective and useful.⁶

In libraries, texting is used as a venue to deliver reference service, thus providing libraries an opportunity to join the national effort of enhancing health literacy via mobile technologies. Texting-based reference service, or text reference service in short, allows library users to send their questions to reference librarians and receive answers in text messages. To ensure the successful fulfillment of users' health information needs, it is important to examine how health-related questions are answered in text reference service, identify the common issues in current practice, and develop strategies for service improvement that ultimately lead to the optimization of user experience. This study examines the health reference transactions from My Info Quest, a nationwide collaborative text reference service, seeking to further the understanding of how to effectively and efficiently utilize texting as a reference service venue to help library users with health information needs.

LITERATURE REVIEW

Reference Librarians as a Health Information Source

The inundation of available health information on the Internet makes it challenging to judge the pertinence, credibility, authoritativeness, and applicability of retrieved information and engenders confusion and frustration among information seekers. About 70 percent of the studies on health information websites found quality to be a problem due to incompleteness and inaccuracy of the information provided.⁷ This problem is further compounded by people's lack of understanding of information retrieval and evaluation strategies. A study of health information seeking behavior revealed that no study participants checked the "About Us" section, disclaimers, or disclosure statements when viewing information gathered from the web.⁸ In another study about the public's use of Internet health resources, three-quarters of health seekers checked the source and date "only sometimes," "hardly ever," or "never," which translated to about 85 million Americans gathering health advice online without consistently examining the quality indicators of the information they find.⁹

Difficulty in locating relevant health information, evaluating its quality, and interpreting it has become a well-documented barrier in the health information seeking process.¹⁰ To overcome this barrier, librarians can help steer users toward the right direction in locating, evaluating, and interpreting high-quality health information, helping users make informed health care decisions and become more health literate.¹¹ Reference librarians are frequently consulted by users

with health information needs.¹² Health information inquiries account for as many as 60 percent of the total reference inquiries at public libraries.¹³ In focus groups conducted by the Reference Point Foundation, all groups reported using libraries for general health information needs, and 60 percent of the participants conveyed that libraries were among their preferred sources of health information.¹⁴

Among the various kinds of inquiries made by the public, health is a top-ten topic area.¹⁵ Baker, Sprang, and Gogolowski found that the top three ranked health-related questions were about specific diseases, drugs, and disease prevention or health promotion.¹⁶ In Wessel et al.'s study, the top three queries were about specific diseases, drugs or medications, and alternative therapies and modalities.¹⁷ The number of health-related questions asked by library users has steadily increased in the past three decades and escalated exponentially since the late 1990s, with the most dramatic growth in questions about specific diseases, medical treatment, drugs, and health care systems.¹⁸ As the Affordable Care Act is implemented, it is to be expected that health insurance questions will increase significantly. In response to that, the Institute of Museum and Library Services and the American Library Association have partnered together to provide resources and support to help librarians prepare for this increased need.¹⁹

Texting-based Health Programs and Campaigns

As of May 2013, 91 percent of American adults have a cell phone. The vast majority of cell phone owners send and receive text messages. Texting is most prevalent among cell phone owners ages 18 to 29—97 percent of them use their cell phones to send texts. The number is nearly as high (92 percent) for those ages 30 to 49.²⁰

The widespread popularity of texting offers great potential to provide people with an expansive level of access to health resources. An increasing number of health organizations and professionals are developing texting campaigns and programs for health promotion. In their book *Texting 4 Health: A Simple, Powerful Way to Improve Lives*, Fogg and Adler summarized ten ways of using texting to improve health behavior arranged in five categories:²¹

- Category 1: Sending information to people
 - Use #1: Educating people. The purpose of text messages is to share tidbits of health content on a predictable schedule. For, example, each day a service can send health research findings, tips about vitamins, or a "health fact of the day."
 - Use #2: Notifying people. Text messages are sent when needed, not on a schedule. These messages may have urgent information such as a warning about air quality or a new epidemic.
 - Use #3: Reminding people. The reminder can be about a personal goal, like remembering to drink water each morning.
- Category 2: Gathering information from people

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- Use #4: Collecting data from people. Texting is used to get people to send data quickly and conveniently from their cell phones (e.g. responding to a one-question survey).
- Use #5: Journaling by individuals. People can use texting to keep a personal journal related to their health behavior.
- Category 3: Getting answers to questions
 - Use #6: Getting answers from a database. People use texting to ask questions related to health, and in response, they receive an answer from a computer database.
 - Use #7: Getting answers from a person. People text their health questions to a real person and receive an answer back from that person, not a computer.
- Category 4: Connecting people to people
 - Use #8: Connecting individuals. Individual health care experts and their patients can interact via texting; health coaches can stay connected with clients; friends can support friends.
 - Use #9: Connecting groups. Texting facilitates group interactions; support groups, discussion threads, and collective action are all possible via the exchange of text messages.
- Category 5: Performing transactions
 - Use #10: Getting things done. This is an emerging use of texting. In the future people may use texting to complete transactions, such as setting appointments at health clinics, buying health products and services, or registering for exercise sessions in their community.

In recent years, the literature has witnessed a spate of studies discussing individual cases about texting-based health information or intervention programs. The majority of them have obtained positive outcomes. Patrick et al. discussed the mobile intervention program mDIET, which used texting to help people eat healthier foods and replace poor dietary behaviors with healthier ones. They found that mDIET participants were extremely satisfied with the program and 96 percent indicated willingness to recommend it to their family, friends, and colleagues.²² Levine described SexINFO, a texting program that provides sexual health services for young people via mobile phones. Evaluation of SexINFO indicated consistent positive associations between demographic risk factors for sexually transmitted infections and program awareness.²³ Cornelius et al., through interviews with African American adolescents, learned that they were receptive to the idea of developing a texting-based intervention and benefited from the approach that sought to enhance adolescent HIV prevention intervention using texting delivery.²⁴ Hingle et al. reported on a study that developed and evaluated a texting delivery protocol designed to influence the nutrition and physical activity knowledge, attitudes, and behavior of adolescents and concluded that the protocol was successful. Youth in this study actively participated in the message design process and engaged with health information through

informal interactions with experts and with one another, thereby increasing the likelihood that they adopted the recommended behaviors.²⁵

As texting-based health initiatives prove to be an effective and successful way of health promotion, texting is becoming a crucial venue through which the public obtains health information and assistance. Therefore it is important for libraries to provide quality service when people text their health questions to librarians. Libraries' text reference service is categorized as Fogg and Adler's health-related texting use #7: "Getting answers from a person." However, this use has not been well evaluated.²⁶ This study seeks to fill the gap in the literature by examining health-related transactions in text reference service.

METHOD

Content analysis was conducted to study two hundred health-related transactions from My Info Quest, a collaborative text reference service participated by fourteen libraries and library systems nationwide. My Info Quest was launched on July 20, 2009, and as of July 2013, it offers service (Central time) from 8 am–10 pm Monday through Thursday, 8 am–6 pm Friday, 9 am–6 pm Saturday, and 2–4 pm Sunday. It uses Mosio Text a Librarian as the service software, which allows librarians to process text reference questions on a computer. Participating librarians take turns logging into the service software and responding to questions during the service period. All library users text their questions to the same number. They usually add a short code in the first message to identify their library; therefore when future messages arrive, the librarian on duty will know the home library of the user.

The unit of analysis in this study was a health-related reference transaction involving an independent question representing a distinct information need. A follow-up question asked to provide clarification was not considered an independent question. For example, a user asked an initial question about the new health care bill, "i was curious as to what are the details and terms of the new health care bill," and then sent a follow-up question "does the new health care bill require all Americans to have health insurance and if not there will be a penalty," to further specify his or her information need. In this transaction, the follow-up question does not represent a new information need; it functions as an attempt to better specify the original need. Therefore it is not considered an independent question.

A convenience sample of two hundred reference transactions was selected. The first one hundred health-related transactions were identified from both the 2011 and 2012 dataset of My Info Quest and included in the sample. Probability sampling was considered but decided against because of the following constraint: although questions and answers can be exported from My Info Quest's account in Mosio Text a Librarian, each transaction is automatically defined as all message exchanges (related to one phone number) within fifteen

Table 1. Categories of health-related questions

Category	%	Example
Questions seeking general factual information about human body, medical/health conditions, diseases, or medical concepts/jargons	25.0	“What is the difference between the semilunar valves and atriventricular valves?”
Questions about healthy living, such as exercise, food, and nutrition	18.0	“Does pefect pushup slim stomach and build muscle?”
Questions about the cause and effect of a medical/health condition or a disease	16.5	“What kinds of diseases can smoking & second hand smoking lead to?”
Questions about the treatment options/healing process of a medical/health condition or a disease	12.5	“Hi. I have a tooth missing in between two other teeth and was going to get a bridge put in. Is there any disadvantage in waiting to have it done say waiting for a year for insurance purposes?”
Questions about the symptoms of a medical/health condition or a disease	8.5	“What are the first signs of tongue cancer or tongue disease?”
Questions about different aspects of drugs	7.0	“What type Of pharmaceutical drug is green to light green/ oval or football shaped/ and may have the inscriptions: 902 on one side. What milligram are these pills?”
Questions about sex or sex-related diseases/conditions	6.5	“Is there something that would cause a slowing in female libido?”
Questions about prevention of a medical/health condition or a disease	2.0	“How do you prevent skin diseases?”
Miscellaneous questions that cannot be described by the above categories, e.g. about medical/health services, organizations, regulations, policies, and statistics	4.0	“Hi. I am blind in an eye and deaf in an ear. Would this prohibit me from being able to get a cdl license and to get a job requiring a cdl license?”

minutes. This transaction definition is different from how the unit of analysis was defined in the study and the inconsistency could be problematic. For example, if a user texts a follow-up question fifteen minutes after the initial one, it will be considered as a new transaction by Mosio Text a Librarian. However, in this study, this follow-up question should be included along with the initial question in one single transaction. This difference posed an insurmountable challenge to identify an accessible study population where a random sample of health-related transactions could be selected.

The alternative was to adopt a nonprobability sampling design and select a convenience sample instead. The complete 2011 and 2012 datasets were carefully combed through from the first day of each year to identify health-related transactions. When the number reached one hundred in each yearly dataset, the examination stopped, yielding a sample of two hundred transactions. The transactions were analyzed to discover (1) what are the types of health-related questions asked in text reference service, (2) what is the length of health reference transactions, (3) how are health-related questions answered, and (4) what information sources are used to answer health-related questions.

RESULTS

The health-related questions in the two hundred transactions fell under nine categories, as shown in table 1. The frequency

distribution of the question categories showed great divergence. There is no dominant question category, and the most frequently asked questions, those “seeking general factual information about human body, medical/health conditions, diseases, or medical concepts/jargons,” only represented one-fourth of the total number of questions.

The majority of the transactions (79 percent) contained only two messages, as indicated in figure 1—usually a question and an answer, indicating that health reference questions sent via texting are usually short, straightforward, and can be briefly answered.

In each transaction, the librarian’s answer was carefully examined, and they could be grouped into the following categories:

1. Library resources were used to answer the question (2.0 percent). For example,

User: “books on homemade tooth past or mouthwash”

Librarian: “SPL has a book called, ‘Natural beauty from the garden’ It has a mouthwash and toothpaste recipe. On the shelf at Franklin and Sylvan Oaks branches.”

2. Direct answer was provided, but without citation to sources (36.0 percent). For example,

User: “What causes snores?”

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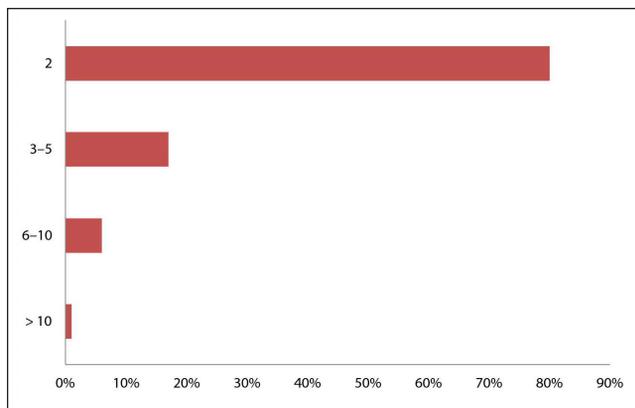


Figure 1. Number of messages in each health reference transaction

Librarian: “Snoring is caused by air vibrating against parts of the respiratory system (usually the uvula or soft palate). The vibration is due to a blocked passageway that can be caused by: throat weakness, mispositioned jaw, sleeping on one’s back, etc.”

3. Direct answer was provided, with citation to sources (34.0 percent). For example,

User: “How many calories in a taco time crisp bean burrito?”

Librarian: “427 calories, acc. to shapeit.com.”

4. Direct answer was provided without citation to sources but with suggestion to consult a medical/health professional (5.0 percent). For example,

User: “Does gum surrounding a tooth grow back after its lost?”

Librarian: “Unfortunately, they will not grow back naturally. You should consult a dental expert to be sure however depending on specifics.”

5. Direct answer was provided, not only with citation to sources, but also with suggestion to consult a medical/health professional (8.5 percent). For example,

User: “I’m taking 20mg of lexipro once a day. Will it hurt me if I have 3 glasses of beer?”

Librarian: “According to the drug interaction information through their website <http://tinyurl.com/3s63tve>, alcohol consumption is not recommended. We cannot make any medical recommendations; you should consult a pharmacist or physician. Thanks.”

6. No direct answer was provided (2.0 percent). For

example,

User: “Is sobe life water with energy listed as a safe drink?”

Librarian: “I’m unable to find any reliable information discussing the safety of SoBe drinks.”

7. No direct answer was provided, instead sources were suggested for exploration or consulting a medical/health professional was recommended (10.5 percent). For example,

User: “What are symptoms of a kidney infection?”

Librarian: “There r many symptoms you can find then at web md <http://www.webmd.com/a-to-z-guides/urinary-tract-infections-in-teens-and-adults-topic-overview>.”

8. Incomplete transactions (2.0 percent), where librarians asked a follow-up question but users did not respond.

Overall, 53 percent of librarians’ answers contained citation to information sources. However, the way the sources were presented varied greatly. In some answers, the specific URL of the webpage about the disease/drug/condition in question was provided, either in full or shortened; following this URL, users would be able to directly view the relevant information that could help them with their questions. In some answers, only the name or the URL of a general medical information website was provided, such as “According to the Medline Plus database” or “According to www.everydayhealth.com.” In some others, there was merely indication that sources were consulted without any further specification, such as “According to several websites on piercings.”

Information sources used in answering users’ questions could be grouped into three categories, as shown in table 2.

DISCUSSION AND CONCLUSION

Health-related text reference questions examined in this study cover a wide variety of topics. They are consistent with the health topics witnessed in other reference service venues.²⁷ It is worth noting that questions about healthy living, such as exercise, food, and nutrition were the second most frequently asked questions, showing an increasing awareness and pursuit of healthy lifestyle. Given library users’ growing interest in this topic, librarians may want to develop ideas to actively promote library resources and programs about healthy living. For example, automatic text or email alerts can be set up to notify users about relevant new books and events at the library. Libraries can also partner with health organizations to design relevant programs that seek to promote healthy living. This will ultimately help enhance the patient activation level

in the nation. Patient activation refers to a person's ability to manage their health and health care. Engaging or activating consumers has become a priority for employers, health plans, and policy makers. Libraries have a critical role to play in this movement as their resources, programs, and services can help more people gain knowledge, skills, and confidence to manage their health.²⁸

Using text reference service, library users can ask questions anonymously. At My Info Quest, users' phone numbers are masked in all reference transactions, and a user ID number is displayed instead. Such anonymity makes it easier for users to approach librarians with sensitive questions. In this study, 6.5 percent of the questions were about sexual health, suggesting that text reference service could be a secure, convenient, and credible source for people, especially teenagers, to ask questions that they would be reluctant to ask in other reference service venues.

Close to 80 percent of the reference transactions in this study contained only two messages, one from the user and one from the librarian. This echoed the findings from Luo and Weak's study about text reference questions in general.²⁹ They analyzed more than three thousand text reference transactions and about three-fourths of them consisted of two messages. This was because most of the questions were ready reference questions, which were usually short and straightforward and could be answered with a specific piece of information. In this study, half of the questions were seeking factual information, either about medical concepts or medical conditions/diseases in general or about the cause, effect, or symptoms of a particular medical condition/disease. Such questions could be answered briefly and directly, therefore would require merely two messages in a reference transaction.

This finding shows that texting is not a venue appropriate for a complex and lengthy reference interview. Library users, when texting a librarian, choose to use this venue for short and specific information needs. There are two contributing factors—first, each text message only allows 160 characters and this limits the amount information each message can convey; second, texting costs money if the user does not have an unlimited texting plan. When responding to text reference questions, librarians tend to be concise as well because of the character limit and cost concerns. As indicated in figure 2, text reference service usually operates on subscription-based gateway software (e.g. Mosio Text a Librarian and Question-Point), and the cost of such software is dependent upon the number of outgoing messages a library subscribes to. If a library can only afford a small number of messages, librarians will need to compose their responses succinctly.

In Luo's study about the essential competencies requisite for providing text reference service, "ability to compose answers to patrons' questions concisely, quickly, and accurately" and "ability to interpret patrons' information needs with limited context in text messages" were identified to be the no. 1 and no. 5 most important competencies, indicating that librarians are fully aware of the affordance of texting as a reference venue and the need to be precise, brief, and fast in

Table 2. Information sources used in librarians' answers

Category	Example
Websites of general medical and health care information, covering a wide variety of medical and health topics.	www.mayoclinic.com www.nlm.nih.gov/medlineplus www.webmd.com www.cdc.gov www.ncbi.nlm.nih.gov/pubmed www.everydayhealth.com http://stfm.org http://my.clevelandclinic.org www.merckmanuals.com www.medicinenet.com www.sharecare.com www.livescience.com
Websites of general information service, including dictionaries, encyclopedias, online Q&A sites, online guides, and news sites.	www.about.com http://answers.yahoo.com http://goaskalice.columbia.edu www.wolframalpha.com www.wikipedia.org www.ehow.com http://ezinearticles.com www.diffen.com http://abcnews.go.com www.usatoday.com http://dictionary.reference.com www.worldbook.com
Websites of specialty medical and health care information. A specialty could be a certain category of medical conditions or diseases, (e.g. heart, dental, sexual, mental), or a particular kind of health needs (e.g. healthy living, weight loss), a specific demographic sector (e.g. children), or a specific region (e.g. California).	www.cocainedrugaddiction.com www.cancer.org www.heart.org www.dentalgentlecare.com www.yourdentistryguide.com www.gastro.org http://siecus.org www.micronutra.com http://caloriecounter.com http://thefruitpages.com http://shapeit.com www.livestrong.com http://cathealthissues.net www.nowloss.com http://gainheight.com http://helpguide.org

their answers.³⁰ To help librarians achieve these competencies, and thus effectively and efficiently answer health-related questions, adequate training is necessary. In addition, a cheat sheet readily available to librarians during their shifts could be helpful too. Such a cheat sheet may contain quick links to library policy and procedures about answering health related questions, frequently used health reference resources on the web (the sources identified in this study may offer some ideas in this regard), a list of texting lingo to help librarians "translate" text messages, and tools like a URL shortener or character counter that could help librarians compose their messages concisely.

In terms of answering questions, this study showed that librarians' behavior varies greatly. This inconsistency is possibly

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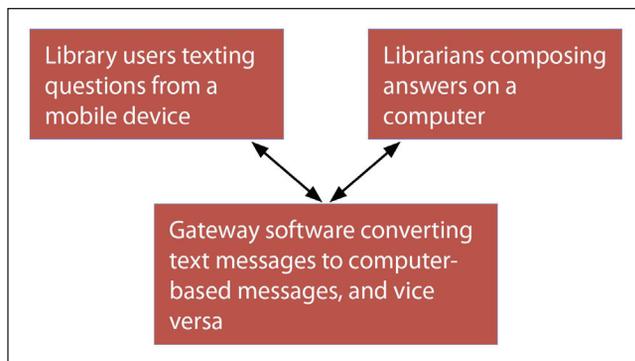


Figure 2. The text reference service process

caused by two factors: (1) librarians participating in My Info Quest are from different libraries, which might have different policies regarding answering health-related questions; (2) My Info Quest is not built upon any existing consortium; instead, it is a self-organized collaborative service and managed by volunteering librarians. The voluntary nature of this collaborative makes it awkward for anyone to police participating librarians. Even if policies and procedures are well established and communicated, some librarians may still exhibit a lack of awareness or a lack of willingness to comply.³¹ Although the inconsistent question-answering behavior is understandable, it is certainly harmful to library users' experience and perception of the service. For instance, if a library user uses the service multiple times and sometimes his questions are answered with citation with sources and sometimes not, it can be confusing and disappointing to the user when he wants to explore the source and do further research. Thus it is important that libraries establish clear guidelines about answering health-related questions and provide sufficient training to help librarians adhere to the guidelines and therefore ensure consistent service quality.

The prelude to formulating question-answering guidelines is to fully understand how library users are asking health-related questions. The examination of the text reference transactions in this study suggests that health-related questions are usually stated in two manners—seeking factual information (e.g., “What are symptoms of a kidney infection”) and seeking advice (e.g., “I’m taking 20mg of lexipro once a day. Will it hurt me if I have 3 glasses of beer?”). To answer questions in the former category, it is necessary to provide a direct answer and a citation to the source. In this study, close to half of the questions were answered without citing the source. This might be a result of librarians' concern of the restrictions of texting as a reference service venue. Yet providing sourced answers is an important mark of reference service and should not be compromised because of the limitations of the service venue. Since most of the sources used in answering text reference questions are web sources, URL shorteners like bit.ly can be helpful in saving characters and shortening the message.

As for questions in the latter category, the literature is abundant with discussions of the challenge of answering such

questions. Library users often blur the line between health information and health advice and they do not understand that librarians' role is limited to helping them with health information and not offering health advice.³² To address this challenge, it is necessary to educate library users about what librarians can and cannot do when assisting them. When answering their questions, librarians should suggest that users consult a medical professional for advice. In the meantime, librarians can still tease out the information needs from the advice-seeking questions and answer them with specific information and source citations.

In conclusion, through a detailed analysis of health reference transactions, this study provides an in-depth understanding of how library users ask health-related questions via texting and how librarians answer these questions. Such an understanding is critical to identifying the common issues in delivering health reference service via texting and to developing strategies to enhance service quality and improve user experience. With health literacy being a national health and public policy priority, it is important for libraries to play a more active role in assisting the public in their quests for health information. As texting-based health programs grow rapidly, more and more library users will become familiar with receiving, processing, and managing health information via this communication venue. Therefore libraries need to be well prepared to offer health information assistance via this venue as well. This study hopes to inform the practice of health reference service via texting and help libraries make evidence-based decisions on establishing service policies and procedures, providing training for librarians, and ultimately implementing the service successfully.

ACKNOWLEDGEMENTS

The authors wish to extend their gratitude to the College of Applied Sciences and Arts at San Jose State University for funding this study.

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