Mobile technologies aide cancer patients in rural areas with digital medicine to seek a second opinion

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Mobile Technologies Seek a Second Opinion

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Mobile Technologies Seek a Second Opinion

Abstract

This mobile application provides cancer patients in rural areas the ability to seek a second opinion from more experienced physicians based on the criteria they input. According to the N.Y. Times there are over 100,000 medical mobile applications, (Krisch, pg. 1) however none that are listed provide a second opinion. Through research and by observing the needs of cancer patients in rural areas, the need for mobile Internet technology is great as rural areas lack connectivity of high-speed PC-based Internet access to access proper medical needs.

This application breaks the digital divide by introducing a mobile platform to seek more experienced physicians who can offer a second opinion. It has been designed on a platform of a hierarchy of needs which guides the user through menus situated in two areas of the application. The design features an aesthetic light blue warm hue, which is inviting to the user. Once the user registers for the application, they are free to engage with others through a forum and ultimately design and implement their own health-care plan.
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INTRODUCTION
In the United States of America, 19.3% of the population consists of rural residents (U.S. Census Bureau, pg. 1). Rural as defined by the U.S. Census Bureau is any area which contains less than 1,000 people per square mile. There are many factors which influence the use and access of technology within these rural areas including availability, cost, knowledge, and whether a household or school has physical access to a computer. In these same rural areas, smart-phone technology is usually an easier and more cost-effective way to access the Internet.

Rural areas also tend to lack the experience, expertise, and most current technology when it comes to the medical field. Although rural physicians are knowledgeable, they do not see the same amount of patients and cases like an urban physician does. When a serious medical condition occurs such as cancer, patients should be assured with a second opinion they are diagnosed correctly and have the best treatment options available.

When a person is diagnosed with cancer they go through many stages of acceptance much like a person who has lost a loved one goes through stages of grief. In order to associate imagery with these emotions a Wordle was created based on text inputted from The American Cancer Society website (americanancer.org, pg. 1). Wordle is a free online tool that organizes text visually to highlight key words and phrases that are prominent within the text or web address the user supplies. In this example, text was used from a section of the American Cancer Society web site that
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assists with newly diagnosed cancer patients

![Figure 1: American Cancer Society “Needs” Wordle](image)

*Figure 1: American Cancer Society “Needs” Wordle* - Represents pertinent thoughts of a newly diagnosed cancer patient. Needs were acquired from designing this Wordle.

The word “cancer” holds prominence because patients are thinking about the disease encapsulating their lives. Although cancer holds prominence, they also think of “others” in their lives that are dependent on them and how cancer will affect them. The development of this Wordle assisted me in identifying what the needs are of cancer patients. Some of these needs include: access to information to research their specific cancer, a treatment plan with a knowledgeable oncologist, medical and disability insurance information, support and positive affirmation, and most importantly HOPE. This mobile application provides all these needs designed in a style that teaches the
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patient how to evaluate all of their options.

This application is built for cancer patients in rural areas because they don’t have the same advantages that patients in urban areas have such as access to the latest technologies, physicians who are well-versed in their specific cancer, and most importantly an assurance of their diagnosis.

Research questions proposed include:

1) What are the needs of cancer patients in rural areas and how can 2nd Opinion gratify those needs?
2) How can the application be designed to reach patients with limited Wi-Fi access?
3) How can the application help patients connect with others who are living with cancer?
4) What are the key components of 2nd opinion that are responsive to the needs of rural patients facing cancer concerns?
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**LITERATURE REVIEW**

Technology has given patients the upper hand in medical diagnoses and treatment because now they can access all of their options on-line. “We have been conditioned to research health information online” (Zemger, Fishman, Horton, Raman, pg.620) and in the wake of websites such as WebMD and Mayo Clinic patients can do more research on their own. They should learn to use these sites prudently however, as many symptoms can fall under similar disease categories.

**Mobile Technology as a Tool in Rural Areas**

Rural areas lack large medical facilities and most physicians have not performed the same number of operations as those in larger cities with higher populations. They have not seen as many unusual cases and have not been exposed to the latest medical technology as urban physicians. In an article regarding social media in medicine by Dr. Snipelisky, Dr. Charles Mayo of Mayo Clinic stated, “Medicine is about as big or as little in any community, large or small, as the physicians make it” (Snipelisky, pg. 2460). In the advent of social media, rural communities now have the opportunity to reach outside their county, city, or even state lines.

Many people in rural communities can't access the Internet or have to pay a hefty price for satellite Internet with data restrictions. These users depend on their smartphones to access the Internet and in particular social media. While there are mobile
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applications where people can research information on a particular ailment, there is presently no application that assists patients in seeking a second opinion with a more experienced physician. “The culture of rural communities can support risky behaviors and serve as a perceived barrier to needed health care” (Logsdon, Mittelberg, Myers (pg. 55). In an article aimed at rural expectant adolescent mothers, the use of technology to research prenatal health information often drove patients to “see a health-care provider as well as change their (risky) behavior” (Logsdon, Mittelberg, Myers, pg.56).

Social Media Assists in a Cure

Patients are more comfortable sharing their health conditions with their friends and family online utilizing sites like Facebook; in fact “One-third of adults have used a form of social media to help diagnose a medical condition (Snipelisky, pg. 2460). People have also shared their diagnosis, treatment options and treatment plan with others for emotional support. Web sites even exist where patients can connect with others who are experiencing the same disease. Patients Like Me (consisting of “nearly 200,000 patients representing more than 1,500 diseases” (Severson, pg. 2) and Hello Health are two examples where patients connect through social media to share their personal data willingly and openly. They waive their HIPPA (The Health Insurance Portability and Accountability Act) rights in order to help each other find the best treatment options and cope with their disease together. “Social media arguably has provided the best means to facilitate discussion among those affected by a certain medical condition and establish communities, as well as identify and facilitate access to
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providers, support groups and advocates” (Chiang, pg. 1).

Friends and family are the greatest advocates and because cancer is so prominent, most people have experienced this serious health condition either personally or second-hand. Social media affords communication and friends and family can offer prayers, kind words, doctor referrals, or even alternative treatment options. “Studies of social support and health also find that how individuals seek social support can be as important as the overall type or amount of support received” (Davis, Anthony, Pauls, pg. 41). The power of support often gives patients more of a will to live adhering to the old adage that positive thinking yields positive results. In the same article referenced above, a quantitative study was performed utilizing data collected from the Harris Poll (HRLP) which gathered data from Facebook. This data set examined how many users over a set amount of time referenced medical terminology and further organized this data by characteristics of users. The study reflected that “people with greater social support, as well as other positive health benefits, including higher income and being married, appear to translate into greater resources online—here more social support—that may affect health over time” (Davis, Anthony, Pauls, pg. 45). What is causing this digital divide between those who have low-income and are not married versus those who are married and have a middle-to-high income?

Anyone can portray whatever identity they wish on-line, however when people start connecting with family and friends on social media sites they can no longer fake their identities. Since the advent of chat rooms users have been categorized by A/S/L
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(age-sex-location) and even now, personal questions are asked within on-line profiles to frame users’ persona's. These profiles and online behaviors create an online experience that is relevant to each user. For example, Facebook uses recent online search behavior to formulate advertisements which might be of interest to their users. This data is used to chunk users into a divide of digital status and hierarchy. Experience and accessibility to technology is a key indication of how much Internet potential users can access. As mentioned previously, access to the Internet can be difficult in rural areas and a mobile smart-phone might be the only method of Internet access.

Mobile Technologies Break the Digital Divide

Venturing deeper into this digital divide, it's important to recognize why this divide exists in the first place since it seems everyone is familiar with technology, or are they? “One of America's leading economic and civil rights issues (of the digital divide)...those left behind include minorities, low income persons, the less educated, and children of single-parent households, particularly when they reside in rural areas or central cities” (LaDousa, pg. 56).

Computers do not always exist in the homes of lower-income families and are absent in the schools without a towering budget. The parents of these children are often striving to put food on the table and do not have time to learn these digital skills themselves. This digital divide will only be more detrimental as technology grows and we turn into a completely paperless society. Job applications are now submitted entirely
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online, medical records are accessed through portals, and one must apply through an
online medical exchange to access health care. Outlets need to be provided for children
and young adults so they can make a conscious decision to improve their digital literacy
skills. This divide also limits how cancer patients access information regarding their
cancer and treatment options. Smartphones might be the only digital access patients in
rural areas have, yet there are millions of mobile apps dedicated to nonsense instead of
providing access to useful information. “The provision of literacy has long provided an
ideological mechanism for the improvement of lives and the provision of digital literacy
is no different” (LaDousa, pg. 226).

Patients need more than just access to physicians who can provide a second
opinion; they also need support groups, methods of transportation and lodging,
information regarding their type of cancer and treatment options, as well as options for
insurance coverage if they aren't currently covered. Patients need to be taught how to
access this information for themselves to not only improve their digital research skills
but ultimately become more knowledgeable about their condition. Because people are
diverse in their medical beliefs and treatment options, searches should provide filters
based on those individual needs. Once those filters are in place, patients can locate a
doctor who is available for them to contact for a second opinion. In a study of rural
adolescent mothers it was noted that most adolescents in general have utilized text
messaging as the preferred method of communication and “agencies such as the Center
for Disease Control have capitalized on widespread cell phone use to reach underserved
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groups” (Logsdon, Mittelberg, Myers, pg. 56).

In an article which attempts to measure the burden of treatment for patients with chronic medical conditions, it was found that in a particular study of patients with diabetes, “If physicians spend about 2 hours each year with diabetic patients, these patients spend approximately 870 hours managing the disease on their own” (Tran, Barnes, Montori, Falissard, Ravaud, pg. 12).

If the tools are provided and the users are taught how to utilize them, technology can afford cancer patients in rural areas to live a longer and more manageable life.
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**METHODOLOGY AND DESIGN PRINCIPLES**

2nd Opinion is based on the human-centered design approach. In the current age of technology, humans have been replaced with technology and computers. Cooley states in his article *Human Centered Design* “current technological development is to render systems active and human beings passive...it is possible to design forms of technology that reverse this process” (Cooley, pg. 66). In order to address this in 2nd Opinion, this application focuses on handing the reigns to the user and teaches them how to locate a physician who can provide a medical second opinion.

Focusing further on Cooley’s human-design characteristics: coherence, inclusiveness, malleability, engagement, ownership, responsiveness, purpose, panoramic, and transcendence were addressed:

*Coherence:*

Even if a user is not completely comfortable with technology, this application provides a coherent menu that is “transparent...highly visible...and shows what is possible” (Cooley, pg. 66). The menu features a menu that is limited but thorough so the user doesn’t get distracted from their main objective. By utilizing a hierarchy of needs, the expanded menu (Figure 12) provides three options that guide the users through the application.” In order for a design to be successful, it must meet the people’s basic needs before it can attempt to satisfy higher-level needs” (Lidwell, Holden, Butler, pg. 124).
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The menu begins with the blog option, moves toward research, and ends with the search. Ultimately, the blog and research are interchangeable however it is important for the user to know that knowledge must be acquired before reaching the last step.

*Inclusiveness:*

The warm blue hues used in this application provide an inviting atmosphere. Limiting the number of colors used also eliminates the user from being distracted and light blue is known to have a calming effect on people. “Light colors will make people lively” (Lidwell, Holden, Butler, pg. 48), and cancer patients need to feel calm and at ease.

By providing immediate access to registration (Figure 11) users will become a part of the community. Within the registration process, they can voluntarily provide personal information including their photo, type of cancer, name and location, age, as well as any additional information they deem appropriate. After registration, they are immediately introduced to their blog which connects them with other users giving them a sense of community and belonging. The use of redundancy within the menus helps the user feel familiar with their options, which is why the menu is featured on the bottom of each page as well as within the menu icon.

*Malleability:*

As mentioned previously, users can share as much personal information as they
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are comfortable sharing. Their privacy is of utmost importance, which is why 2nd Opinion “molds the situation to suit” (Cooley, pg. 68). Each individual has specific needs they wish to address and it is their choice how visible they wish to be. They also are provided with a physician search with adjustable filters (Figure 15) to develop their second opinion. For instance, users can filter by: specialty, location, gender, and language depending on their individual needs.

Engagement:

The opening page to the application (Figure 11) informs the user what types of people will be utilizing this application which reaffirms whether this application is suitable for them. “A second opinion is a life-saving tool no matter where you live” informs the new user that they belong to this community and others are also here to engage with them.

The icon used in the logo represents more than just a human face, as seen in (Figure 10) the outline of the face is gender-neutral and the rounding of the top of the “2” represents an emotional response many people have regarding treatment of their cancer. Many cancer patients fear they will lose their hair after receiving chemotherapy treatment so Face-ism ratio was used to eliminate any gender inequality the user might perceive. High Face-ism ratio is used to “focus attention on the person’s intellectual and personality attributes” (Lidwell, Holden, Butler, pg. 88).
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Ownership

This application is based on teaching the user how to research, share, and search for a second opinion. Once they have utilized this application to implement a second opinion, they will gain confidence in their achievement. Ownership is “a feeling that you have created and thereby own parts of the system” (Cooley, pg. 68). In this instance, users create a search utilizing filters based on knowledge gained through research and social interaction with others. The brunt of the work has been completed by the user who will find pride in their second opinion achievement.

Responsiveness:

The application initially introduces the need to register to the user and at that point the user either accepts whether they wish to become a part of the community or not. Registration is the one tool that is required, however after that, the process falls into the hands of the user. Moderation is provided to eliminate any inappropriate content or conduct, but overall this site is then designed by the user. The use of a blog allows users to share as much information as they feel comfortable with. Within the blog users can also connect within their own rural areas to create groups, carpool options, locations that feature Wi-Fi hot-spots and Internet access, and whatever other categories they deem helpful.
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Purpose:

The main use of this application is to encourage rural cancer patients to go outside their comfort zone to locate a physician who can provide them with a second opinion. It is up to the user to “respond to the purpose and encourage him or her to go beyond it” (Cooley, pg. 70). Once the user locates a physician they feel can assist them, it is their responsibility to contact the physician, make an appointment, travel to the destination, and ultimately decide based on that second opinion what treatment plan is suitable for them.

Panoramic

The menu options are limited; however within each menu option is a plethora of knowledge the user can gain. For instance, the link to WebMD lets the user research their type of cancer utilizing text, images, and videos; while the blog option lets the users create groups to locate information within their own rural location.

Transcendence:

By handing the reigns to the user after the initial registration process, the user is “encouraged, enticed, and even provoked to transcend the immediate task requirements” (Cooley, pg. 70). They are encouraged to connect with other users and create networks of information that are helpful and knowledgeable. The greatest recommendations are from those who share similar circumstances and this blog encourages users to openly
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share their experiences even after they have gained their second opinions.

This design project asks what needs does a cancer patient in a rural area have and how can this application gratify those needs utilizing technology? “Today's human centered design is based on the use of techniques which communicate, interact, empathise and stimulate the people involved, obtaining an understanding of their needs, desires and experiences which often transcends that which the people themselves actually realised” (Giacomin, pg. 4). This application recognizes that cancer patients in rural areas often only access on-line medical information through mobile technologies due to the high cost or unavailability of satellite Internet. 2nd Opinion affords users the ability to seek several options including resources for locating an experienced physician, the ability to connect to a network of existing patients with similar conditions, information regarding the specific cancer with the help of WebMD, affordable options for travel and lodging to physicians, and how to determine which physicians accept their insurance.

Patients can teach themselves utilizing this application how to locate information that is pertinent to their treatment plan. This idea stems from Bloom's Taxonomy, which is a method of learning starting with a teacher-centered approach and ultimately blooming into a student-centered approach. This application provides a link to information to research their disease, but ultimately the tools provided will guide them to locate the best alternatives for their second opinion. The user will work toward that goal utilizing all aspects of Bloom's Taxonomy from Remembering-Understanding-
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Analyzing & Applying, Evaluation, and Creating. Let's explore how these steps of Bloom's Taxonomy within 2nd Opinion are used. In the remembering stage users can research their specific cancer using information ported from WebMD, which provides textual and video knowledge. Within understanding, users now have a better idea about their condition and can begin to research their type of cancer by utilizing the filters which organize physicians by various specialties. Analyzing & applying is addressed by allowing the user to engage in communication with others who share similar conditions. This is accomplished by providing a blog that can be shared publicly or privately based on the user's choice of privacy settings. Users can evaluate their experience by performing searches to locate specific doctors in reference to their condition. The final phase of creating lets the user forge their treatment plan. While the application provides the knowledge, it's ultimately the user who contacts the physician to obtain their second opinion.
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**DESIGNING THE APPLICATION**

The wire-frame was designed utilizing Mokk.Me which is a beta mobile application software tool available at no cost. This online freeware lets a user design an outline of their application and provided the necessary html code to eventually create a downloadable application.

**Figure 2: Jing Mokk.Me Screenshot**-Mokk.Me is a great tool built on basic html to get an idea of how an application can look before its literal creation. There is also the ability to test the wireframe on your iPhone.

Please see below for the wireframe created in Mokk.Me for the 2nd Opinion application.

Please visit link to view entire wire-frame: [http://mokk.me/e/3oHTsPHzchEZdMRM](http://mokk.me/e/3oHTsPHzchEZdMRM)

Application can also be tested by opening link on iPhone: [http://mokk.me/v/LjmPsVES](http://mokk.me/v/LjmPsVES)
Figure 3: Popplet Wireframe - Utilized Popplet to build a wireframe organizing my app into a hierarchy of needs.
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![Wireframe Splash Page](image)

**Figure 4: Wireframe Splash Page:** It is important that the user immediately recognizes the app.
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Figure 5: Wireframe Home Screen—It is important that the user knows where to begin the process to become part of the community, therefore a registration process is immediately placed on the home screen.
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**Figure 6: Wireframe Expanded Menu** - Expanded menu is easy to navigate so I only included three icons for: blog, WebMD, and physician search.
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Figure 7: Wireframe WebMD - WebMD will be ported into the application and the user will not need to re-register to use.
Figure 8: Wireframe Forum—The forum will be search-able by user location as well as the type of physician the user is looking for. This is an optional filter if the user does not need to limit users by location.
Figure 9: Wireframe Physician Search—Users can search for a physician based on their preferences. They are not required to complete any fields.
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Because this application utilizes an iPhone platform, initial design was designed for iOS with the intent to venture into Android and Windows so all users are able to access the application regardless of what type of Smartphone or Tablet they own. The iPhone ranges in sizes from the iPhone 4 which is 4” to the iPhone 6 which is 5.5”.

![iPhone Size Comparison](image)

**Figure 10: iPhone Size Comparison** - Mokk.Me currently caters to iPhone platforms. The goal in the future is to offer this application for Android and tablet.

The prototype was designed using Adobe Photoshop utilizing the blank iPhone platform image from Mokk.Me; which insured consistency of ratio.
Figure 11: 2nd Opinion Splash Screen Prototype—This page serves to inform users that they have downloaded the correct application and the logo invites them into the 2nd Opinion mobile application.
Figure 12: *2nd Opinion Home Screen Prototype*- Users will see after the application initially loads. Menu prompts register or log-in.
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**Figure 13:** 2nd Opinion Expanded Menu Screen Prototype—Both the expanded menu as well as the menu on the bottom is consistent throughout the app. Easy navigability is essential on a mobile platform.
Figure 14: 2nd Opinion WebMD Screen Prototype - When the user chooses the WebMD option they will not have to leave the 2nd Opinion app. The WebMD app is ported into 2nd Opinion.
Figure 15: 2nd Opinion Forum Screen Prototype - The forum allows the user to share as much information as they feel comfortable. Sharing in the forum is optional but encouraged.
Figure 16: 2nd Opinion Search Screen Prototype - Physician search contains personalized filters so the user can design their own experience.
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ANALYSIS

An analysis was performed by viewing existing websites that focused on cancer including The American Cancer website and WebMD. No patients were directly contacted or observed and therefore did not need approval from IRB. Personal experience also played a large role as I am a thyroid cancer survivor who was misdiagnosed in my local area. Only after receiving a second opinion in New York City did I realize that only half of my thyroid needed to be removed and although two biopsies showed cancer; my extracted lobe showed none. Research findings were completed through data analysis from The Pew Research Center and The United States Census Bureau.
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FINDINGS

Research Questions and Answers:

1) What are the needs of cancer patients in rural areas and how can 2nd Opinion gratify those needs? This is the primary research question that is based on (Figure 1). This Wordle was created based on the concerns of newly diagnosed cancer patients from The American Cancer Society website. Their most prominent concern is justifiably cancer, which seems to take over all others concerns. Some of their concerns include others, treatment, medical, diagnosis, denial, time, experience, and knowledge. Users desire: access to information within a mobile platform due to Internet restrictions, cost, and availability, the ability to find a skilled physician well-versed in the latest technology and treatments for their type of cancer, ways to access information regarding insurance, transportation, and lodging, the ability to research their specific cancer, a forum where they can engage with others who are experiencing a similar medical situation, and support and positive affirmation.

2) How can the application be designed to reach patients with limited Wi-Fi access? This application features an open forum where users can create groups according to their location. Users can provide useful information such as places to access free Wi-Fi, Internet hot-spots, ride-shares, insurance information, as well as personal experiences. The actual design of this application is very basic and does not include high-resolution images, which might delay those users with slower networks. The user has the option of utilizing video through WebMD; however this is not a necessity in order to utilize the
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application. The application will also feature a text-only option for those users who desire a faster mobile experience without the hassle of waiting for images to load.

3) How can the application help patients connect with others who are living with cancer? Studies find that social interaction amongst friends and family on social media sites like Facebook assist in maintaining a positive outlook on life and healing. Social interaction also solidifies the human design theory helping the user experience inclusiveness and companionship. The user can also gain more information within their community such as Internet hot-spots, free Wi-Fi, ride-shares, discounted lodging, insurance coverage, and personal reflections of how 2nd Opinion worked for them.

4) What are the key components of 2nd opinion that are responsive to the needs of rural patients facing cancer concerns? The key components include those areas addressed in (Figure 1) which is a Wordle designed around the thoughts of people recently diagnosed with cancer. The most important aspect is the cancer itself, so users must be able to execute research on the application. This has been accomplished by porting into WebMD’s mobile application. WebMD is an established research site that has agreed to partner with 2nd Opinion for the sake of helping save lives.

Other findings outside the initial research questions involve: cost and availability, crushing the digital divide, and further reflection on e-empathy.

Cost and Availability

As mentioned in the Literature Review, the largest disadvantage rural cancer patients have is the inability to access high-speed Internet at an affordable cost. In place of PC-based
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Internet access, people in rural areas depend greatly on Internet access through their Smartphones. In a research study conducted by PEW, 91% of American Adults have cell phone access with 85% having access in rural areas (Rainie, pg. 1). This number varies greatly from the 53% of rural Americans who don’t have access to high speed Internet access through their computer.

Satellite Internet cost is also a factor in Internet accessibility as it can be as costly as $5 per megabyte of usage. The Internet can also be available through the local telephone company utilizing dial-up or DSL, which often requires a subscription to land-line service. If a patient is in a very remote rural area, Internet service might not be available at all. As mentioned previously, users can share areas within their local groups where free Internet access is available and where areas of higher mobile connectivity exist.

Digital Divide

The digital divide still exists in America even with the growth of technology and the struggle for access in all areas of the country. Both homes and schools in rural areas lack funds to properly promote education of computer literacy. If parents were not taught how to utilize technology they are unable to assist their children. If schools are not provided with computers and instructors who can teach these skills, children will be left behind in the age of technology. According to the National Organization of State Offices of Rural Health, residents in rural areas make an average salary of $40,615 while the average salary in urban areas is over $50,000. This hardship places a burden on struggling families who might bypass the high cost of the Internet
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in order to pay their energy bill.

*E-Empathy*

Connecting with others in similar situations can help cancer patients better cope and understand their disease. Social support has shown to relieve stress and ultimately improve how the patient copes with their disease. “Social media can play a critical role in patients’ taking charge of their own health because of its informational, emotional, and communicative value. It has the power to connect patients and families to sources of information and support networks that might help educate, support, and empower them” (Zember, Fishman, Horton, Raman, pg. 620). It has been said that people connect with those who share similarities and ultimately they find comfort in the familiarity.
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CONCLUSION

Second opinions help save lives, and people in rural areas will benefit from ensuring they have the correct diagnosis and treatment plan in place. All people can benefit from receiving the best health-care possible and a limitation to access of technology shouldn’t be a barrier. Designers need to examine the methods that all people have to access technology and create a usable product to meet every-one’s criteria.

Breaking digital divides is the first step to delivering technology to all. Providing a mobile application that assists the user in learning, helps eliminate that divide. The other important aspect within 2nd Opinion is the social connection which allows people to connect and educate themselves and others. The Internet is rich with ordinary people creating their own blogs, YouTube channels, newsfeeds, and viral videos. 2nd Opinion gives users in otherwise obscure areas of the country the ability to connect with anyone in similar situations who can provide support and advice.

Social support has proven to be a motivating medicine; which is what 2nd opinion is inspired on. Finding hope in the midst of a life-threatening diagnosis is the beginning of finding a cure for cancer. Internet access might not be available for every person in The United States, however incorporating 2nd Opinion as a mobile application will give at least 32% more of the rural population better tools to treat their cancer.

Utilizing Wordle once again, an image is created based on the thoughts from cancer
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survivors from the American Cancer website (www.cancer.org).

![Figure 17: American Cancer Society “Survivor” Wordle](image)

Figure 17: American Cancer Society “Survivor” Wordle - Wordle created from www.cancer.org based on testimonies of cancer survivors.

When a patient has the best treatment available, they can focus less on cancer and more on LIVING.
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