

Accuracy of Health and Wellness Messages provided by *ChaCha*, The Mobile Answers Text Message Service

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Abstract

A relatively new mobile text message service, ChaCha, describes itself as “a smart search engine powered by human intelligence.” The service claims to provide high-quality, accurate information, yet there is no research published to date substantiating this claim. The purpose of this study was to assess the extent to which health and wellness-related information disseminated by ChaCha is accurate and complete. The study consisted of texting 40 pre-determined health-related questions to ChaCha, compiling answers, and analyzing answers for accuracy and completeness. Using a Likert-type rubric, accuracy was determined by comparing ChaCha responses to three of the most well-known and popular college health textbooks. Results indicated only 12.5% of ChaCha responses were rated accurate and complete, while 22.5 % of ChaCha’s responses rated completely inaccurate/incomplete. In summary, while ChaCha provides a fast, efficient method to find answers, the accuracy and completeness of the answers is questionable and not consistent with evidence-based research. Translation to Health Education Practice: Health educators can use the results of this study to alert the public that ChaCha is not a reliable source for health and wellness-related information.

Key Words: *Health literacy, Internet, Consumer health information, Health and wellness.*

Introduction

From simple questions to complex, answers are now just a few key-strokes away. The internet serves as a reference for just about everything, from checking scores of ballgames to assisting in major medical decisions. Search engines, such as Google and Yahoo, provide a vast number of sites to sift through to find information. The question that must be asked is whether such information is accurate.

Along with the rise of the internet, cell phone usage is also skyrocketing. A study conducted by EDUCASE Center for Applied Research found that nearly 85 percent of all college students carry a cell phone.¹ Originally intended as wireless phone service, cell phones have evolved greatly to have the capability to download music and ringtones, surf the net, and send text and photo messages. Although EDUCASE reports only 19% of Americans use smartphones that allow for downloading learning material,¹ that number is likely to increase substantially. With the combination of the internet and cell phone usage, search engines including Google have initiated computer-automated text message answer services.^{2,3}

A relatively new mobile text message service, *ChaCha*, describes itself as “a smart search engine powered by human intelligence”.³ *ChaCha* is a relatively free service (meaning you only pay if your cell phone service charges a text fee) powered by guides who quickly navigate and filter through websites to find an answer. The value of *ChaCha* is that consumers who do not have access to the internet can quickly use their cell phone to find an answer to virtually anything by texting their question to *ChaCha* (242242). The service claims to provide only high-quality, accurate information, yet there is no published research to date substantiating this claim.

Literature Review

Accuracy of health education information disseminated via the World Wide Web

The Internet has changed the way Americans obtain information and make personal decisions. The Pew Internet Project estimates that 74% of American adults use the Internet. According to the December 2007 survey, 75% search online for health information.⁴ This estimate has grown from January 2001, where 55% of American adults with Internet

access have used the Web to get health or medical information.⁴

Concern remains evident through various studies^{5,6} regarding the quality of information, and the credibility of Web sites which disseminate health information. Additionally, as the Internet evolves and grows, so does the number of people searching for health information. Health practitioners receive numerous questions from patients regarding information they have encountered online. Integration of online sources with patient education is a new area of development for some practitioners, but challenges remain in guiding patients to reliable and accurate web-sites.⁷

The evaluation of health information on the Internet has been recognized by various groups and guidelines have been developed,^{5,8} however, a specific set of standards is yet to exist.^{9,10} The National Institutes on Health has created a specific list of guidelines for ensuring the quality of information disseminated to the public online.¹¹ Healthy People 2010 has incorporated a new goal of communication objectives, a measure of increasing adequate quality information on the Internet.¹²

In December 2007, a group of eight pediatric dermatologists examined the accuracy and completeness of information on a specific topic by searching Google. Only four sites of 50 evaluated were considered accurate and complete enough for the dermatologists to recommend them to their patients. The results of that study are consistent with others that have viewed medical information on the Web.¹³

A study published in the May 22, 2002, *Journal of the American Medical Association* reviewed the quality of consumer health information on the World Wide Web. Published and non-published studies which evaluated accuracy of online health information were both reviewed. The discrepancy between study methods and quality criteria concludes that there needs to be defined quality criteria to accurately review the quality of health-related websites.¹⁴ The quality of health information disseminated by the Internet continues to be a concern for public health.^{7,13-14}

It is reported that 89% of Internet users make use of search engines to find information.⁴ The massive array of search engines can be perplexing to the common web user. Yahoo, developed in 1994, remains the oldest of Web directories.²⁰ Yahoo also contains a search engine index. Around 2001 Google

was created by a company that no longer exists.²¹ The success of Google has been unparalleled. Google now ranks as the most popular search engine.^{20,22}

Google's success is based on the fact that its search engines are not only comprehensive but designed for maximum speed. Google's search engines are critical for the survival of many internet-based businesses. Google results are not only used by Yahoo, but also many other web-based components such as Netscape. FAST Search, also known as 'All the Web', is another popular search engine. It contains a large index and was the first search engine to achieve the 200 million results mark.^{20,23} The remaining popular search engines include Ask, AOL search, and MSN search.

In September of 2006, another desktop search engine service surfaced, known as *ChaCha*. The principle behind the evolution of *ChaCha* is for consumers to have access to an infinite amount of answers via the internet, even when they do not have access to the internet. When consumers need instant answers about politics, breaking news, health, sports and so on, they can simply text message a question to *ChaCha* via their cell phone. The difference between *ChaCha* and the other search engines is that it is operated by human guides to provide answers. The live-guide then returns a concise answer within minutes which may include a reference to a web-site. Because of being human-driven, *ChaCha* claims to offer high-quality results geared by human intelligence.²⁴⁻²⁶

In January 2008, *ChaCha* services advanced by becoming the first 'human guided' mobile text messaging service free to consumers. The concept is of great ingenuity: ask a question via text message, and receive a simple yet accurate answer. The goal is to provide an accurate answer within minutes via cell phone text message in less than 160 characters.^{24,26} The company advertises service by encouraging consumers to "ask a question from their mobile phone as if they're talking to a smart friend."²⁴ *ChaCha* prides itself on claiming to be the 'smart search engine'. Accuracy of answers from *ChaCha* have been reported between 93-95%,²⁶⁻²⁷ however, the method of how *ChaCha* measures accuracy is not available.

Accuracy of health education information disseminated by ChaCha

According to *ChaCha.com*, there are over 55,000 *ChaCha* guides, with thousands online at any given time, to answer the 9 million plus text questions they receive every month.²⁴ According to *ChaCha*

Incorporation, *ChaCha* guides are internet-savvy individuals who are equipped with Internet search training and tools to help answer questions.²⁸ Prior to collecting data, a *ChaCha* guide was consulted to determine how guides were prepared or assessed to be qualified. The goal was to obtain background information on *ChaCha* guides, assess qualifications and training of guides, ascertain how guides determine what information to send text users, and what, if any, consequences there are for providing incorrect information.

A *ChaCha* guide applicant must complete a two-hour evaluation assessing how quickly and efficiently one can search the Internet for answers to questions, is assessed to see if they can succinctly put the answer in a 160 character text message. The only training guides received is on how to summarize complex answers into 160 character text messages. *ChaCha* recommends reputable websites for the guides to use and suggests avoidance of questionable websites. However, guides are welcome to use websites they feel most comfortable with. There is no penalty for providing misinformation to users.

Thousands of guides may be on-line at any given time. If a guide would like to work, they just log in to the *ChaCha* Universe system to answer questions. Questions texted to *ChaCha* (242242) are routed by an expeditor to a guide. Guides may answer anywhere from 20 to 50 questions per hour depending on the time of day. *ChaCha* keeps a log of questions from each cell phone number for 2-3 days.

Purpose of Study

The purpose of this study was to assess the accuracy of health and wellness-related information provided by *ChaCha*, the mobile text messaging service. The results will identify whether or not the information disseminated by *ChaCha* should be used by the public in making health-related decisions.

Methods

To assess the level of accuracy and completeness of health information disseminated by the mobile text messaging service *ChaCha*, the study consisted of texting 40 pre-determined health-related questions to *ChaCha*, compiling answers, and analyzing answers and websites referred for accuracy and completeness. Using the nationally recognized 10 content areas of health, the team developed 40 questions. The questions were texted to *ChaCha* by the team over a

period of one week. Each question was asked twice verbatim, for a total of 80 text questions to *ChaCha*. The questions were asked at varying times of the day and staggered so that the same question was not asked at the same time. The 10 content areas of health can be found in Table 1.

Accuracy was determined by comparing *ChaCha* responses to three of the most well-known and popular college health textbooks.²⁹⁻³¹ The textbooks were chosen because they are the three best-selling textbooks at the university level and are seen as appropriate and comprehensive in the field of health. The textbooks rely on evidence-based materials and provide an inclusive overview of personal health.

The level of accuracy of responses was scored using a Likert-type rubric ranging from 1 (did not answer question or completely inaccurate), 2 (answer mostly inaccurate and incomplete), 3 (answer partially accurate), 4 (answer mostly accurate yet left out key points), and 5 (answer accurate and complete). Responses were considered superior (5) only if the message provided was entirely accurate and did not lack any vital information. Websites referred by *ChaCha* were analyzed in the same manner.

Inter-rater reliability analysis

To establish inter-rater reliability, two team members reviewed and assessed all *ChaCha* responses. The remaining two team members reviewed and assessed a random sample of *ChaCha* responses. All four reviewers have a minimum of a Master's degree in health and teach personal health at the university level. Each question was rated a minimum of three times. Comparison of overall assessment scores were examined between reviewers. Team members rated *ChaCha* responses identically or within one Likert point 92.7% (78/80) of the time indicating a high level of internal consistency.

This study received full Institutional Review Board (IRB) approval and followed all IRB protocol.

Results

To determine the extent to which *ChaCha* disseminated accurate and complete answers to health related questions, a rubric ranging from 1 (inaccurate and incomplete) to 5 (accurate and complete) were used as the evaluation tool. Table 2 reveals the frequencies and percentages of the ratings. Twenty-two and a half percent of the answers were given a rating of 1, 12.5% of the answers were

given a rating of 2, 21.25% of the answers were given a rating of 3, 31.25% were given a rating of 4, and 12.5% of the answers were given a rating of 5. According to the results of the inter-rater reliability, there were 6 questions that received inconsistent ratings by all researchers, or 7.5 % (refer to Table 2). Ten out of the 80 questions asked were rated a 5 (accurate and complete) while 18 out of the 80 questions were given a 1 (inaccurate and incomplete).

The ratings were also assessed within each health content area: emotional and mental health; family living; growth and development; nutrition; personal health and physical activity; alcohol, tobacco, and other drugs; communicable and chronic diseases; injury prevention and safety; consumer health; and environmental health. Notably, the areas of family living, growth and development, and nutrition received no ratings of 5 by the raters while consumer health and environmental health received neither a rating of 4 nor a rating of 5. In contrast, the area of injury prevention and safety received no rating of 1 while the area of communicable and chronic diseases received neither a rating of 1 nor a rating of 2 (see Table 2). These results showed *ChaCha* disseminating the most accurate information when answering questions regarding communicable and chronic diseases and the least accurate information when answering questions regarding consumer health and environmental health.

Half of the content areas contained at least one rating of 5 (complete and accurate). An example from the mental and emotional health content area is: How common are mental disorders? The response provided by *ChaCha* was, "An estimated 26.2% of adult Americans ages 18 and older suffer from a diagnosable mental disorder in a given year." This response was rated a 5 (complete and accurate) because it was consistent with the information provided by all three textbooks.²⁹⁻³¹ Seven of the content areas contained at least one rating of 1 (incomplete and inaccurate). An example from the alcohol, tobacco, and other drugs content area is: Is there any cure for a hangover? The response provided by *ChaCha* was, "Consume foods and drinks that contain fructose (such as fruit juice or honey). This will help your body burn the alcohol." This response is not accurate or complete. According to two of the textbooks, there is no "cure" for a hangover. In order to limit the effects of a hangover, the only option is to not drink alcohol or to not drink in excess.³⁰⁻³¹ See Table 3 for sample questions and text responses rating 1-5.

When *ChaCha* referred researchers to a website, the website was assessed for accuracy and completeness of the information. The same ratings used to assess text responses were used to assess the websites. Only five of the 80 text responses had a website referral. The ratings given to the websites were, 5, 4, 4, 4, and 2. This showed that while the websites did provide slightly more accurate and complete information, they were not websites that could be used by consumers to get the best possible answer to their health-related questions.

Of the five websites provided by *ChaCha*, two were in the content area family living. The website <http://www.webmd.com/sex/birth-control/forgot-to-take-your-birth-control-pills> was provided in response to the question, "What should I do if I forgot to take a birth control pill for a day?" WebMD offered complete and accurate information, and was given a rating of 5, for the question advising the consumer to take the pill as soon as she remembers. Also, the website urges the consumer to call a healthcare provider, read the instructions on the birth control pack, and always remember to use another form of contraception until the pill pack is finished. This information is consistent with the answer provided by the textbooks.²⁹⁻³¹

Another website, <http://www.hairanalysistest.com/>, was provided as a response to the question, "Should I get my hair analyzed to find out if I have nutrient deficiencies?" This question was included in the nutrition content area. The website was rated 2 (mostly inaccurate and incomplete) by the researchers because it was giving inaccurate information, possibly to promote a product. The last two websites were in response to questions from the environmental health content area.

Conclusions

Data analyses indicated *ChaCha* is not a credible source for health-related information. *ChaCha*'s responses were cross-referenced with three of the most widely recognized and used health textbooks in the college setting, and although these textbooks may not be complete and accurate in all aspects, they were chosen as the best framework to be used for this study. The *ChaCha* responses results yielded low scores for both accuracy and completeness. With certainty, we can conclude *ChaCha*'s ability to respond accurately to specific health related questions is dubious and is not consistent with evidence-based research.

Results indicated only 12.5% were rated accurate and complete, while 22.5 % of *ChaCha*'s responses were rated completely inaccurate/incomplete. This finding is contradictory to *ChaCha*'s self-reported 93% accuracy rate.²⁶⁻²⁷ Given the maximum 160 character text message allowance, *ChaCha* had either not given enough information to accurately answer the question or had given incorrect information that they received from an unreliable source.

ChaCha was most accurate when disseminating information regarding communicable diseases. The answers are not noteworthy, but the results do show minor strength to the knowledge one can receive within a text message. Conversely, *ChaCha* was least accurate when disseminating information regarding chronic diseases. The inconsistent answers to the 10 health content areas suggest *ChaCha* is not a reliable source to answer important health and wellness questions.

The second part of the study investigated the extent to which the websites *ChaCha* refers are accurate and complete. Only 6% of the responses came with a website referral. The website ratings yielded a higher, or more accurate, result than text alone, however it was not remarkable. This suggests consumers will obtain a more detailed answer through the website referrals, unfortunately there is no guarantee the website is accurate and complete. Our findings are congruent with various studies^{7,13-15,19} that question the accuracy and quality of health information on the Internet.

In summary, while *ChaCha* provides a fast, efficient method to find answers, the accuracy of the answers is limited at best. The vast majority of the answers to our health-related questions were only partially accurate, with key points omitted. Omitting key points, such as using alternative methods of birth control after missing a birth control pill, could have potentially devastating results. In addition, misinformation may encourage consumers to spend money on something completely unfounded, such as a hair analysis for nutrient deficiencies. If the difference between being health literate and health illiterate means being able to process, understand, and make appropriate decisions with health information, then it could mean the difference between taking the recommended dosage of a medication and taking a lethal dosage.³² This information, combined with the fact that a large proportion of the American population is lacking any type of health literacy training, leads the researchers to be concerned about the impact of Americans utilizing technologies such as *ChaCha*. How will the

American public determine what is considered valued data when they do not have any health literacy training? While *ChaCha* provides a fast, efficient method to find answers, the accuracy and completeness of the answers is questionable and not consistent with evidence-based research. The findings are consistent with previous research questioning the accuracy and quality of health information on the Internet. Translation to Health Education Practice: Health educators can use the results of this study to alert the public that *ChaCha* is not a reliable source for health and wellness-related information.

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Table 1. 10 Content Areas of Health

Mental & Emotional Health
Family Living
Growth & Development
Nutrition
Personal Health & Physical Activity
Alcohol, Tobacco & Other Drugs
Communicable & Chronic Diseases
Injury Prevention & Safety
Consumer Health
Environmental Health

Table 2. Range of Accuracy (Percentage) Among Ten Content Areas

Content Area and Average Score	Inaccurate	Mostly Inaccurate	Partially Accurate	Mostly Accurate	Accurate
Overall	22.5	12.5	23.8	21.2	12.5
Mental & Emotional	50.0	0.0	0.0	25.0	25.0
Family Living	25.0	25.0	0.0	50.0	0.0
Growth & Development	12.5	25.0	25.0	37.5	0.0
Nutrition	50.0	0.0	25.0	25.0	0.0
Personal Health & Physical Activity	25.0	12.5	0.0	37.5	25.0
Alcohol, Tobacco, & Other Drugs	50.0	0.0	25.0	12.5	12.5
Communicable & Chronic Diseases	0.0	0.0	57.14	14.29	28.57
Injury Prevention & Safety	0.0	25.0	25.0	12.5	37.5
Consumer Health	16.67	50.0	33.33	0.0	0.0
Environmental Health	0.0	0.0	100.0	0.0	0.0

Table 3. Sample Questions, Responses, and Ratings

Rating	Question Texted	ChaCha's Response	Explanation of Rating
1	Is there any cure for a hangover?	"Consume foods and drinks that contain fructose (such as fruit juice or honey). This will help your body burn the alcohol."	Inaccurate and incomplete. According to two of the textbooks, there is no "cure" for a hangover. In order limit the effects of a hangover, the only option is to not drink alcohol or to not drink in excess.
2	What is an HMO?	"An HMO, Health Maintenance Organization, is a specific type of health care plan found in the United States."	Mostly inaccurate and doesn't give any specific information. According to the textbooks, an HMO is a type of managed care plan that provides a wide range of covered health benefits for a fixed amount prepaid by the consumer.
3	What is photochemical smog, and should I be worried about it?	"Photochemical smog is a mixture of pollutants which includes particulates, nitrogen oxides, ozone, aldehydes, peroxethanoyl."	Partially accurate. This response, however, only answers the first half of the question.
4	What should I do if I forget to take a birth control pill for a day?	"When you forget, take it as soon as you remember. If you don't remember until the next day, go ahead and take 2 pills that day."	Mostly accurate. This answer is accurate, but it leaves out one piece of important information. According to the text books, it is necessary to use another form of contraception in order to prevent pregnancy.
5	How common are mental disorders?	"An estimated 26.2% of adult Americans ages 18 and older suffer from a diagnosable mental disorder in a given year."	Complete and accurate. This answer is consistent with the information provided by all three text books.