

BEHAVIORS AND PERCEPTIONS CONCERNING ONLINE NUTRITION
INFORMATION AMONG YOUNG ADULT MIDWEST UNIVERSITY STUDENTS

A thesis

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ABSTRACT

Since the inception of the Internet, Americans have become increasingly dependent upon this medium for gleaning information, with each new generation being more apt to seek information online. This general trend has affected, among many other things, the search for health and nutrition information. While the Internet can provide a wealth of beneficial information for users, it can pose a myriad of dangers, as well, if users do not know how to look for credible information.

The objectives of this study were to determine where university students search for nutrition information and what criteria they use when seeking nutrition information online. The population sampled was from a Midwest University. Participants were selected via convenience sampling methods. Students were invited to participate in an online survey available campus-wide. Data was analyzed using SPSS statistical software.

This study found that 73% of students surveyed indicated they use the Internet to search for nutrition information online. Government websites and product websites were shown to be chosen most often as being visited for nutrition information. The credibility criteria most often chosen as being important included date of publication or update of information, the information's being authored by a medical doctor, and the web address ending in ".gov."

The results of this study identified that the majority of university students sampled used the Internet when searching for nutrition information and identified several criteria that students use when determining online nutrition information's credibility. These results can be used to help

health professionals, and registered dietitians in particular, know how best to provide and promote online health and nutrition information for consumers. Young adults are leading the trend of searching for health and nutrition information online, and registered dietitians need to provide timely, and understandable information for the public in order to best meet their needs.

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CHAPTER 1

INTRODUCTION

Significance of the Study

The Internet provides users with a wealth of information at their fingertips. From search engines to blogs to social networks to professional sites, Internet users can find information on almost any subject matter in which they are interested, including health and nutrition. A myriad of information, both credible and specious, presents itself to Internet users searching for nutrition and health information.

Young adults today are more connected to the Internet than any other generation. Where previous generations would have sought out hard-copy literature and in-person consults with professionals in order to learn more about health topics, the current young adult generation tends to search for information online. If registered dietitians and other health professionals are going to move forward to reach this demographic, they need to know where these young adults are going online to find nutrition information and what those young adults are looking for on these sites.

The objective of this research study is to determine:

1. Where young adult college students search for nutrition topics, and
2. How they decide what information to trust.

This study was approved by the Institutional Review Board (IRB) of Indiana State University. The IRB determined that the study design warranted Exemption Status #2, eliminating the need for further (See Appendix A).

With this knowledge in hand, registered dietitians and other health professionals can be better prepared to meet consumers where they are searching, making themselves available to assist those consumers with reliable nutrition information.

Definition of Terms

The following terms are being defined as described to help promote uniformity of understanding throughout this report.

General health: state of health devoid of illness or disease

Young adult: an individual aged 18-30 years old

Limitations

One significant limitation of this study was its sample size. Because of the size, Chi-Square tests may not be accurate, as several crosstabulations had expected values < 5 and/or expected outcomes > 1 . Because of this limitation, the relationships shown in this study's crosstabulations cannot be considered reliable, and this study can at best be used to describe general trends among young adult university students at the Midwest university surveyed without providing significant insight on correlations between variables.

The planned method for this study's survey distribution was to announce the survey via student intranet site and global email each week until either three weeks had passed or 200 students completed the survey. However, the survey was announced during the summer, when students were less likely to check the intranet or their student emails than during the school year. After three weeks only 46 students has completed the survey. Also, unbeknownst to the

researcher, the global emails were not being sent to students during the summer, so the only means of announcement was the student intranet site. Because the sample size was drastically too small, the researcher sent the announcement out a fourth time, once the fall semester had begun, when it was distributed via both the intranet site and the global email. This distribution period lasted one week.

Delimitations

This study was exploratory in nature, the purpose being to explore beliefs and perceptions of young adults regarding nutrition information found online. Due to its nature and its purpose, this study's results do not determine online searching behaviors and perceptions of individuals younger than 18 or older than 30 years old. This study was concerned with the young adult age group as a whole, and therefore differences within the demographic of young adult university students were not analyzed in great detail.

The research was designed to be exploratory because little research has been published regarding young adults' perceptions and beliefs regarding online nutrition information. Because of this deficit in published material and the exploratory nature of the study, the research focused on description rather than the proving or disproving of hypotheses.

The sampling method used for this research was convenience sampling. The reasons this sampling method was selected include its ability to procure a larger number of participants than other sampling methods, its ease of use, and its low cost. Inherently, convenience sampling provides less generalizability than randomized sampling methods. Therefore, it cannot be assumed that the results from this study are representative of the target population. Further research will be needed to determine the generalizability of this study's results.

A significant delimitation associated with this study was that the survey was distributed online. It is likely that the students who are most likely to take an online survey are already familiar and comfortable with using the Internet for other activities, such as looking for health and nutrition information. However, this method of survey distribution provided the best available means of reaching the largest percentage of the university population, as nearly all students would have been required to visit the student intranet site or to check their email inboxes during the course of the survey distribution period.

CHAPTER 2

REVIEW OF LITERATURE

Autonomously Seeking Health Information

The American public has become increasingly more autonomous in their search for health and nutrition information. According to the Academy of Nutrition and Dietetics' *Nutrition and You: Trends 2011* survey, the percentage of Americans who reported actively seeking information regarding nutrition and a healthy diet in 2011 had increased from 19% to 46% since the turn of the century (American Dietetic Association [ADA], 2011).

Among those surveyed in the *Nutrition and You: Trends 2011* (ADA, 2011), the majority of participants reported acquiring their nutrition information from the media, with television, magazines, and the Internet leading as the most frequently sought sources for nutrition information. Since it was first included on the Nutrition and You Survey in 1995, the Internet has seen a drastic increase in the percentage of survey respondents who use this medium to search for nutrition information, rising from 3% to 40% of respondents between 1995 and 2011 (ADA, 2011). Other research (Renahy & Chauvin, 2006) has shown that younger adults more frequently seek nutrition and health information from the Internet than do older adults.

According to the Pew Internet & American Life Project (Fox, 2006) in 2006 approximately 80% of Internet users reported having searched for health information online, and approximately half of Internet users searched specifically for nutrition information. Two-thirds

of individuals who reported searching for health information searched via a generic search engine (such as Google or Yahoo), while just over one-fourth began their searches on a health-related website. Younger adults (18-29 years old) were more likely to start with a generic search engine than were older adults (Fox, 2006).

Also indicated from the Pew Internet & American Life Project (Fox & Purcell, 2010), adults living with a chronic disease condition reported searching for medical advice online less often than other adults, reporting instead that they seek medical advice directly from medical health professionals. If they did use the Internet to glean health information, adults with chronic diseases tended to connect with peers via blogs and discussion boards to gain knowledge and support (Fox & Purcell, 2010).

Benefits of Autonomously Seeking Health Information

Health information available via electronic media has the potential to unite consumers' desire to assume responsibility for their personal health with health professionals' desire to utilize consumers' capacity to exert personal effort toward good health (Eysenbach & Diepgen, 2001). Electronic health information can also lower health care costs by eliminating unnecessary visits to health care providers and by empowering consumers with information to live healthier lives. Consumers can also use electronic health information to help ensure that their health care providers are considering all reasonable treatment options and discuss these options with their providers (Eysenbach & Diepgen, 2001). In 2006, over half of Internet users who searched for health information reported feeling reassured about self-efficacy in making decisions, feeling confident about talking with their doctors, feeling relieved about the health conditions researched, and feeling eager to share information with others due to the health information they found online (Fox, 2006).

Problems with Autonomously Seeking Health Information

Despite Americans' growing interest in autonomously seeking health information, many consumers have reported marked confusion in interpreting available scientific studies regarding health and nutrition (Wansink, 2006). Adding to the ambiguity, public figures and popular companies may provide consumers with nutrition misinformation—intentionally or unintentionally—in order to promote a personal agenda or to sell a product. Without proper guidance, individuals can be left vulnerable to confusing and even harmful nutrition misinformation (Wansink, 2006).

Nutrition remains one of the most confusing health topics covered by the media for consumers (Rowe, 2001). Some of the confusion results from ineffective conveyance of information from the scientist to the reporting medium, whether written or spoken (Rowe, 2001). The media often choose celebrities, rather than health professionals, as spokespersons for nutrition information due to the relationship they have already established with the audience and due to their existing function as models for the public (Wilson, 2007). Additional confusion arises when media sources fail to provide sufficient information for consumers to understand the extent of research studies or when they provide only preliminary information without providing updates (Wansink, 2006). The Internet also presents a significant barrier to accurate nutrition information in that its content cannot be regulated. Sites such as blogs, chat rooms, and discussion lists can proliferate nutrition misinformation (Wansink, 2006).

Consumers may find information that is irrelevant, false, or misleading, which can lead to useless or even harmful self-diagnosis and treatment. Consumers can experience difficulty evaluating electronic health information due to the lack of information regarding the intended target population for the information and the absence of the author's name or credentials

(Eysenbach & Diepgen, 2001). Health information has caused many Internet searchers to feel overwhelmed by the volume of information available, to feel frustrated at not finding what they believed they needed, and to feel frightened by the information they did find (Fox, 2006).

Internet Users' Perception of Online Health Information's Credibility

A survey conducted in 2006 investigated various factors that determined website users' perspective on health information. The survey was conducted on the site www.passeportsante.net, a site based in Montreal, Canada, dedicated to information on complementary and alternative medicines in conjunction with conventional medical care (Lemire, Paré, Sicotte, & Harvey, 2008). The majority of survey participants were from Canada or European countries. The survey indicated that people came to the website in order to learn more about a specific health condition, especially to learn about different viewpoints concerning health conditions, or to learn about treatment options. Other reasons to visit the website included seeking information on illness prevention and seeking information to help someone else with a health concern. Survey respondents were more likely to use the site often if they perceived the information provided there was able to satisfy their needs, if they trusted the information found on the website, if they trusted health information from the media in general, if they trusted the opinions of health professionals, and if they were concerned about their personal health (Lemire et al., 2008).

The Medical Library Association (MLA, 2011) advises internet users to evaluate the content of online health websites based on: sponsorship—whether the sponsor is credible and/or is biased; time—whether the website is updated frequently with current information; factuality—whether the information is fact versus opinion and is verifiable; and intended audience—whether the information was written for consumers or for health professionals. According to the Pew

Internet & American Life Project, only one-fourth of adults who search for health information online reported checking the date and source of online health information, at least most of the time, when they search for information (Fox, 2006).

Rains & Karmikel (2009) examined undergraduate university students' perceptions of health website credibility in regards to website and message characteristics. They found message content inclusions of statistics, testimonials, external citations, direct quotes, author identification, and date of publication/update, did not significantly increase participants' perception of the information's credibility. Researchers did, however, observe a significant positive association between external factors—third-party endorsements, pictures and illustrations, provisions of an address or phone number, an accessible privacy policy, a website directory, organization name, and external links—and participants' perception of a website's credibility.

According to the Academy of Nutrition and Dietetics' *Nutrition and You: Trends 2011*, the sources most often perceived as “very credible” were registered dietitians and dietitians, with 71% of survey respondents indicating that they believed them credible. Other leading sources were doctors, nurses, and the USDA's *MyPyramid*. Only 17% of participants described the Internet as a “very credible” source for nutrition information, although 40% of participants reported having sought information from the Internet (ADA, 2011).

Registered Dietitians as Credible Sources

The Academy of Nutrition and Dietetics believes that registered dietitians and dietetic technicians, registered are in a position to lead in primary, secondary, and tertiary health care to combat nutrition misinformation and to protect the health of the American Public (Stitzel, 2006). According to the *Nutrition and You: Trends 2011* survey, 85% of participants indicated they had

heard of registered dietitians. Also, 74% indicated they knew there was a difference between a registered dietitian and a nutritionist (ADA, 2011).

CHAPTER 3

METHODS

Research Design

Questionnaire Design

This study implemented an exploratory design method, employing an online survey to gather data concerning young adult students' perspectives of online nutrition information and trends in their seeking of online nutrition information. The survey was created and dispersed using the online survey program Qualtrics. The survey contained multiple-choice questions and Likert-scale questions for participants to answer. Survey questions sought to measure students' behaviors and perceptions regarding online nutrition information by measuring where they sought nutrition information online, for whom, and for what purpose. The survey also sought to determine whether students value registered dietitians as a credible source of online nutrition information. The survey was designed so that participants who answered that they did not seek online nutrition information would be directed to the end of the survey without filling out the remainder, as all following questions would have been irrelevant to them. Participants completed and submitted the survey anonymously online. (See Survey in the Appendix B).

This research used an original survey based on review of pertinent research (ADA, 2011; Eysenbach & Diepgen, 2001; Fox, 2006; MLA, 2011; Rains & Karmikel, 2009; and Wansink, 2006). Questions on the survey were created based on characteristics of credibility and

demographics of participants most relevant to the research objective. The survey was piloted to a small sample size of 8 students prior to its being made available for participants. The pilot study revealed no necessary changes to be made to the survey.

Participants

The target population in this study consisted of currently enrolled Midwest university students aged 18-30. The potential target population size was approximately 9,000 students. All socioeconomic groups and both genders were targeted. The study's sample size was 236 participants. In answer to the third question of the survey, 9 participants indicated they never use the Internet when looking for information on nutrition topics. These participants were not asked the remaining questions, as they all related to Internet sources, leaving 227 participants for questions 4 through 7 of the survey.

Sampling Method

Sampling was conducted via convenience sampling methods. Students were invited to participate in the study via an announcement in the student intranet site, the university's intranet site, and via an invitation sent through the university's global email system, which includes all enrolled students (approximately 12,000). The announcement and link to the study's survey on the student intranet site was available for four nonconsecutive weeks. The email invitation with the link was sent to students at the same time as the final intranet announcement and link.

Upon clicking on the link to the study, participants were informed in writing that the survey would be used for research purposes for a graduate student thesis. Participants were told they would be answering questions related to online nutrition information. Participants were provided an informed consent page before beginning the survey. Participants were informed they would be able to discontinue the survey at any point without consequences. Participants were

also informed that information entered into the survey would be kept as confidential as possible, though confidentiality could not be absolutely ensured. Completion of the survey indicated informed consent.

Data Analysis

Survey results were collected using Qualtrics survey software and transferred to SPSS Statistics Software for analysis. Data was analyzed using Frequencies to determine modes, and using Crosstabulation to determine whether significant relationships existed between variables. The Pearson Chi-Square was used to determine significance based on observed level of significance, $p < 0.05$. The Pearson Chi-Square test was chosen because each of the variables tested was independent, and the purpose of the study was to identify relationships between the variables. Specific relationships analyzed using Crosstabulation included participants' education level and credibility criteria; type of Internet source and person for whom information is sought; and purpose of searching for nutrition information and credibility criteria.

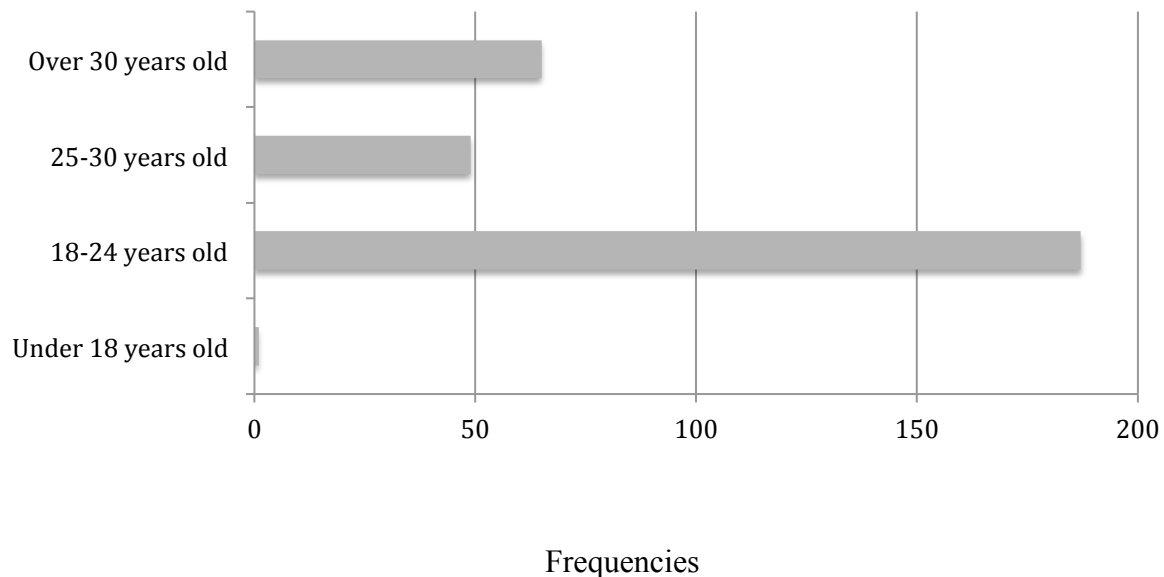
CHAPTER 4

RESULTS

The survey was distributed online June 28 through September 3, 2012, with intranet announcements distributed four times and an email sent to the student body during this time frame. At the end of the survey distribution period, 310 students had participated in the study. However, only 236 fell within the age group of 18-30 years old and were included in the data analysis (See Figure 1).

Figure 1.

Age distribution of study participants (n = 310)



Of the study participants, 3.0% (n=7) were working toward an associate's degree, 71.2% (n=168) were working toward a bachelor's degree, 18.2% (n=43) were working toward a

master's degree, 3.8% (n=9) were working on a doctorate, 0.8% (n=2) were non-degree seeking, and 2.5% (n=6) were working on an "other" degree (See Table 1). Responses entered under the "Other" category included a second bachelor's degree, an Ed.S. degree, and having just completed a bachelor's or master's degree.

Table 1

What level of degree are you working toward?

	Frequency	Percent
Associates degree	7	3.0%
Bachelor's degree	168	71.2%
Master's degree	43	18.2%
Doctorate	9	3.8%
Non-degree seeking	2	0.8%
Other	6	2.5%
Missing	1	0.4%
Total	236	100.0%

When asked what sources they used when looking for information about nutrition topics, 59% of participants (n=140) indicated they never used Registered Dietitians as a source. More participants selected Never Use for Registered Dietitians than for any other source. Only 15% of participants (n=36) indicated they used Registered Dietitians Often or Most of the time when looking for information on nutrition topics. More participants (n=127, 59%) indicated that they used the Internet Most of the time than any other source when looking for nutrition information. The second most often selected source was Doctors (n=36, 16%) and Family and Friends (n=35, 16%) (See Table 2). Answers written in under Other included: Google Scholar, nutrition labels,

books about health-related topics, documentaries, anything related to the media or “fad diets,” a registered dietitian in the family, and other coaches.

Table 2

Sources for nutrition information

	Never Use ¹	Use Sometimes ¹	Use Often ¹	Use Most of the Time ¹	Total Responses ²
Internet	9 (4%)	29 (13%)	62 (27%)	127 (56%)	227 (96%)
Doctors	38 (17%)	106 (48%)	42 (19%)	36 (16%)	222 (94%)
Family and Friends	33 (15%)	88 (39%)	67 (30%)	35 (16%)	223 (95%)
Nurses	80 (36%)	79 (36%)	35 (16%)	27 (12%)	221 (94%)
Articles in scholarly journals	114 (51%)	56 (25%)	32 (14%)	20 (9%)	222 (94%)
Registered dietitians	140 (63%)	46 (21%)	20 (9%)	16 (7%)	222 (94%)
Fitness centers	88 (39%)	81 (36%)	41 (18%)	14 (6%)	224 (95%)
Health stores	107 (49%)	68 (31%)	37 (17%)	8 (4%)	220 (93%)
Magazines	62 (28%)	112 (51%)	39 (18%)	7 (3%)	220 (93%)
Popular Books	133 (60%)	65 (30%)	16 (7%)	6 (3%)	220 (93%)
Television	91 (42%)	101 (46%)	24 (11%)	3 (1%)	219 (93%)
Other	87 (89%)	4 (4%)	4 (4%)	3 (3%)	98 (42%)
Newspaper	138 (64%)	68 (31%)	8 (4%)	2 (1%)	216 (92%)

¹ Percentage of participants who responded to this question

² Percentage of total participants

Most frequently selected answer for each source is in Bold.

The nine participants who indicated they Never Use the Internet when searching for nutrition information were not given the remainder of the survey which asks questions regarding Internet search habits. The total participants remaining equaled 227 students.

Government websites (n=101, 47%) and Product websites (n=66, 31%) were most likely to be visited Very Often or Every Time when participants looked for information about nutrition online. Although only 3% (n=7) of participants answered that they visit News sites Every Time, 26% (n=55) indicated they do so Very Often, indicating that the news media remains an influential source of nutrition information. Blogs and discussion boards ranked lowest in frequency of being visited with 55% (n=119) of participants indicating they Never visit blogs and 53% (n=114) of participants indicating they Never visit discussion boards to obtain nutrition information (See Table 3). Responses written in under Other included: Google search engine, non-government health websites, Web MD, unaffiliated nutrition websites (such as calorieking.com and myfitnesspal.com), Pinterest, Food Network, YouTube, sparkpeople.com, and recipe sites

Table 3

Frequency of visiting Internet sources for nutrition information

	Never Visit ¹	Visit Sometimes ¹	Visit Often ¹	Visit Every Time ¹	Total Responses ²
Government sites	39 (18%)	74 (35%)	67 (31%)	34 (16%)	214 (94%)
Product Websites	60 (28%)	87 (41%)	42 (20%)	24 (11%)	213 (94%)
Scholarly Journal Databases	98 (47%)	58 (28%)	41 (20%)	13 (6%)	210 (93%)
Social Networking Sites	109 (52%)	62 (29%)	28 (13%)	12 (57%)	211 (93%)
News Sites	67 (31%)	84 (39%)	55 (26%)	7 (33%)	213 (94%)
Blogs	119 (55%)	66 (31%)	27 (13%)	4 (2%)	216 (95%)
Discussion Boards	114 (53%)	69 (32%)	28 (13%)	3 (1%)	214 (94%)
Other	64 (85%)	0 (0%)	8 (11%)	3 (4%)	75 (33%)

¹ Percentage of participants who responded to this question

² Percentage of total participants

By far, the majority of participants indicated that the information they search for online is Very Often or Always for self (n=180, 83%). Most participants indicated that they Never (n=97) or only Occasionally (n=77, 39%) search for online nutrition information for no one in particular. Family (n=61, 28%) surpassed Friends (n=35, 16%) in being the person for whom online nutrition information is sought Always or Very Often (See Table 4).

Table 4

For whom nutrition information is sought

	Never ¹	Occasionally ¹	Very Often ¹	Always ¹	Total Responses ²
Myself	4 (2%)	33 (15%)	83 (38%)	97 (45%)	217 (96%)
Friends	47 (22%)	132 (62%)	27 (13%)	8 (4%)	214 (94%)
Family member	45 (21%)	109 (51%)	54 (25%)	7 (3%)	215 (94%)
Nobody in particular	97 (49%)	77 (39%)	20 (10%)	6 (3%)	200 (88%)

¹ Percentage of participants who responded to this question

² Percentage of total participants

Most participants indicated that, Very Often or Always, they are looking for general nutrition information for living a healthy lifestyle (n=151, 71%), with finding information regarding a pre-existing health condition (n=75, 36%) and diagnosing specific problem (n=71, 34%) following behind. Networking with others regarding a previously diagnosed condition (n=139, 66%) was most often selected as never being the motivation to seek nutrition information online (See Table 5). Participants' Other reasons to look for nutrition information online included: to gain muscle/weight; weight loss; to find nutrition related to training and

competition; to help athletes; to find herbal, natural, or homeopathic remedies; personal interest; supplements; and to get ideas about how to cook healthier meals.

Table 5

Purpose of seeking online nutrition information

Reason	Never ¹	Occasionally ¹	Very Often ¹	Always ¹	Total Responses ²
To learn about general nutrition so that I can lead a healthier lifestyle	7 (3%)	54 (25%)	102 (48%)	49 (23%)	212 (93%)
To learn more about a previously diagnosed condition	61 (29%)	75 (36%)	48 (23%)	27 (13%)	211 (93%)
To determine whether to seek medical attention	74 (35%)	78 (37%)	41 (19%)	18 (9%)	211 (93%)
To diagnose specific problems I or someone I know has been having	46 (22%)	94 (45%)	53 (25%)	18 (23%)	211 (93%)
Prior to a doctor's appointment to gain background information	86 (41%)	76 (36%)	32 (15%)	17 (8%)	211 (93%)
To network with others regarding a previously diagnosed conditions	139 (66%)	44 (21%)	18 (9%)	9 (4%)	210 (93%)
To fulfill a class requirement	94 (44%)	81 (38%)	29 (14%)	8 (4%)	212 (93%)
Other	60 (29%)	4 (2%)	5 (2%)	3 (1%)	205 (90%)

¹ Percentage of participants who responded to this question

² Percentage of total participants

For the purpose of analysis, the answers Not at all Important, Very Unimportant, and Somewhat Unimportant were all categorized as Unimportant. Likewise, the answers Somewhat Important, Very Important, and Extremely Important were categorized as Important. When asked

what is important to students when they determined whether an Internet source is credible, the highest number of participants indicated that the date of the information's writing or update was at least somewhat important (n=165, 81%). Following closely for being ranked at least somewhat important were: the information's being authored by a medical doctor (n=164, 80%), the site address ending in ".gov" (n=164, 81%), and the site address ending in ".edu" (n=163, 80%). The information's being authored by a registered dietitian ranked 5th out of 14 criteria for credibility as being at least somewhat important (n=159, 79%) and was least often chosen as being at least somewhat unimportant (n=18, 9%). Celebrity endorsements/quotes was the only credibility criteria with the majority of participants (n=168, 82%) indicating that it was at least somewhat unimportant (See Table 6). Responses written in under Other for credibility criteria included: credibility of source regardless of URL, unbiased information, consistency of information with other reliable sources, and being peer reviewed and published in a credible scientific database.

Table 6

Credibility criteria of online nutrition information

	Unimportant ¹	Neither Important nor Unimportant ¹	Important	Total Responses ²
Date when information was written or last updated	21 (10%)	17 (8%)	165 (81%)	203 (89%)
Information authored by a medical doctor	19 (9%)	21 (10%)	164 (80%)	204 (90%)
Site address ending in .gov	20 (10%)	18 (9%)	164 (81%)	202 (89%)
Site address ending in .edu	21 (10%)	19 (9%)	163 (80%)	203 (89%)

Table 6 (continued)

Credibility criteria of online nutrition information

	Unimportant ¹	Neither Important nor Unimportant ¹	Important	Total Responses ²
Information authored by a nutritionist	21 (10%)	32 (16%)	151 (74%)	204 (90%)
Site address ending in .org	32 (16%)	25 (12%)	148 (72%)	205 (90%)
Information authored by a registered nurse	31 (15%)	33 (16%)	139 (68%)	203 (89%)
Information authored by another health professional	38 (19%)	39 (19%)	126 (62%)	203 (89%)
Quotes/endorsement by a registered dietitian	60 (30%)	31 (15%)	111 (55%)	202 (89%)
Quotes/endorsement by a nutritionist	61 (30%)	39 (17%)	103 (51%)	203 (89%)
Quotes/endorsement by a medical doctor	69 (34%)	36 (18%)	97 (48%)	202 (89%)
Other	50 (70%)	10 (14%)	11 (15%)	71 (31%)
Quotes/endorsement by a celebrity	168 (82%)	26 (13%)	10 (5%)	204 (90%)

¹ Percentage of participants who responded to this question

² Percentage of total participants

Crosstabulations

Level of education showed no significant relationship with credibility criteria except for whether a medical doctor authored ($p = 0.007$) or endorsed ($p = 0.047$) the information. No other criteria showed any relationship with level of education, based on observed level of significance, $p < 0.05$ using Pearson's Chi-Square test (See Table 7).

Table 7

Crosstabulation - Level of educational degree with credibility criteria

	Education Level
Site address ending in .org	$p = 0.268$
Site address ending in .edu	$p = 0.414$
Site address ending in .gov	$p = 0.482$
Information authored by a medical doctor	$p = 0.007^*$
Information authored by a registered nurse	$p = 0.592$
Information authored by a registered dietitian	$p = 0.697$
Information authored by a nutritionist	$p = 0.229$
Information authored by another health professional	$p = 0.166$
Quotes/endorsements by a celebrity	$p = 0.675$
Quotes/endorsements by a medical doctor	$p = 0.047^*$
Quotes/endorsements by a registered dietitian	$p = 0.236$
Quotes/endorsements by a nutritionist	$p = 0.213$
Date when information was written or last updated	$p = 0.853$
Other	$p = 0.598$

* Significantly related ($p < 0.05$)

This study seems to have shown a relationship between students' looking up information for the purpose of deciding whether to seek medical attention and the credibility criteria of the information being authored by a nutritionist ($p = 0.043$). Also, the study seems to have shown a relationship between the information's being authored by a medical doctor and a student's looking for nutrition information for general health ($p = 0.009$). Students' looking for

information related to classwork showed a relationship with considering the credibility criteria of the website's address ending in ".edu" ($p=0.045$) (See Table 8).

Table 8

Crosstabulation – Reason for Internet search for nutrition information with credibility criteria

	General nutrition	Class requirement	Diagnose problems	Before MD Appointment	Determine MD need	Pre-existing condition	Network	Other
Site “.org”	$p = 0.848$	$p = 0.066$	$p = 0.248$	$p = 0.023^*$	$p = 0.238$	$p = 0.056$	$p = 0.018^*$	$p = 0.812$
Site “.edu”	$p = 0.053$	$p = 0.045^*$	$p = 0.176$	$p = 0.140$	$p = 0.399$	$p = 0.431$	$p = 0.133$	$p = 0.715$
Site “.gov”	$p = 0.476$	$p = 0.062$	$p = 0.112$	$p = 0.005^*$	$p = 0.428$	$p = 0.103$	$p = 0.326$	$p = 0.031^*$
MD author	$p = 0.009^*$	$p = 0.399$	$p = 0.931$	$p = 0.026^*$	$p = 0.277$	$p = 0.695$	$p = 0.089$	$p = 0.053$
RN author	$p = 0.099$	$p = 0.99$	$p = 0.985$	$p = 0.014^*$	$p = 0.295$	$p = 0.685$	$p = 0.068$	$p = 0.472$
RD author	$p = 0.523$	$p = 0.186$	$p = 0.255$	$p = 0.052$	$p = 0.079$	$p = 0.581$	$p = 0.124$	$p = 0.837$
Nutritionist author	$p = 0.464$	$p = 0.613$	$p = 0.401$	$p = 0.005^*$	$p = 0.043^*$	$p = 0.765$	$p = 0.077$	$p = 0.746$
Other H.P. author	$p = 0.929$	$p = 0.260$	$p = 0.359$	$p = 0.001^*$	$p = 0.088$	$p = 0.404$	$p = 0.008^*$	$p = 0.503$
Celebrity quotes	$p = 0.001^*$	$p = 0.001^*$	$p = 0.009^*$	$p = 0.169$	$p = 0.001^*$	$p = 0.594$	$p = 0.002^*$	$p = 0.448$
MD quotes	$p = 0.502$	$p = 0.072$	$p = 0.188$	$p = 0.648$	$p = 0.059$	$p = 0.743$	$p = 0.081$	$p = 0.308$
RD quotes	$p = 0.293$	$p = 0.059$	$p = 0.138$	$p = 0.906$	$p = 0.220$	$p = 0.745$	$p = 0.026^*$	$p = 0.322$
Nutritionist quotes	$p = 0.347$	$p = 0.413$	$p = 0.257$	$p = 0.859$	$p = 0.111$	$p = 0.604$	$p = 0.029^*$	$p = 0.207$
Date	$p = 0.918$	$p = 0.581$	$p = 0.787$	$p = 0.859$	$p = 0.836$	$p = 0.729$	$p = 0.547$	$p = 0.780$
Other	$p = 0.732$	$p = 0.969$	$p = 0.722$	$p = 0.976$	$p = 0.880$	$p = 0.799$	$p = 0.785$	$p = 0.029^*$

* Significantly related ($p < 0.05$)

CHAPTER 5

DISCUSSION

The results of this study showed that students at the Midwest university surveyed were using the Internet to search for information about nutrition topics far more than they used any other resource. Of those who responded to the survey, 76% indicated that they use the Internet; this percentage is much higher than that found in the Nutrition and You Survey (40% in 2011), indicating that young adults are indeed leading the growing trend to go to the Internet for health information (ADA, 2011; Renahy & Chauvin, 2006). In contrast to going to the Internet, very few students surveyed said they went to registered dietitians for information. However, a large number of students were looking for dietitians' presence on the Internet. Therefore, instead of trying to reach students with nutrition information face-to-face, registered dietitians may be more effective in influencing students by providing solid, research-based nutrition information on the Internet for this population.

The most common reason to look for nutrition information, according to this study, was to learn about general nutrition. However, contrary to Eysenbach and Diepgen's findings (2001), learning about a preexisting condition was also a popular reason to search for nutrition information online. Again, the younger age of the population may account for their use of the Internet concerning their conditions.

The significance of product websites' influence as a source for nutrition information may be disconcerting to many health professionals, as such sites can provide misleading information just to get a sale (Wansink, 2006). While health professionals cannot stop misinformation from being published online, they can provide user-friendly guides to health products and focusing on key nutrition principles when counseling and educating the public instead of focusing on controversial topics (Wansink, 2006).

Of those polled, 73% of survey participants indicated they considered the date of information's writing or updating to be important when determining the information's credibility. This awareness coincides with the MLA's advice to evaluate website content in part on its update frequency (MLA, 2011). This study's finding is opposite of Rains and Karmikel (2009), which found that among the university students studied, date of publication/update did not significantly influence perception of credibility for a website. This discrepancy may have been due to differences in method design. In the current study, participants were asked to identify credibility criteria, whereas in Rains and Karmikel's study, participants were told to search the web for information and then researchers analyzed participants' findings for credibility.

In order to reach the greatest number of young adults, dietitians should look to the platforms of government, product, and news websites, as students indicated these are the sites they most often look to for nutrition information. Research studies and other resources best suited for use in class assignments and reports may best be utilized by students if registered dietitians provide the information on school websites ending in ".edu" as this study indicated a possible relationship between class use and considering

such websites credible. These sites tend to be considered credible regardless of the reason for the information search, anyway.

Conclusion

The first objective of this study was to determine where young adult college students search for information on nutrition topics. The majority of students completing the survey indicated that they are using the Internet in their search. Knowing this result can help direct dietitians to this venue for reaching the young adult population.

The second objective of this study was to determine how young adult college students determine which information to trust in their search. Date of publication/update and the website's address provide some of the most common criteria that the surveyed students use in determining whether or not to trust a site's information. By providing current information on reputable sites, dietitians can provide health-promoting nutrition information to young adult students via reputable websites.

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APPENDIX A: IRB APPROVAL LETTER



Institutional Review Board

Terre Haute, Indiana 47809
812-237-3092
Fax 812-237-3092

DATE: June 26, 2012

TO: Brenda Moeckly

FROM: Indiana State University Institutional Review Board

STUDY TITLE: [278195-1] Behaviors and Perceptions Concerning Online Nutrition Information Among Midwest Young Adult University Students

IRB REFERENCE #: 12-127

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: June 18, 2012

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of New Project materials for this research study. The Indiana State University Institutional Review Board has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations (45 CFR 46). You do not need to submit continuation requests or a completion report. Should you need to make modifications to your protocol or informed consent forms that do not fall within the exempt categories, you will have to reapply to the IRB for review of your modified study.

[remove if not applicable]

Internet Research: You are using an internet platform to collect data on human subjects. Although your study is exempt from IRB review, ISU has specific policies about internet research that you should follow to the best of your ability and capability. Please review Section L. on Internet Research in the IRB Policy Manual.

Informed Consent: All ISU faculty, staff, and students conducting human subjects research within the "exempt" category are still ethically bound to follow the basic ethical principles of the Belmont Report: a) respect for persons; 2) beneficence; and 3) justice. These three principles are best reflected in the practice of obtaining informed consent.

If you have any questions, please contact Dr. Vicki Hammen within IRBNet by clicking on the study title on the "My Projects" screen and the "Send Project Mail" button on the left side of the "New Project Message" screen. I wish you well in completing your study.

APPENDIX B: SURVEY OF YOUNG ADULT UNIVERSITY STUDENTS'
PERCEPTIONS AND BEHAVIORS WHEN SEARCHING FOR ONLINE
NUTRITION INFORMATION

Informed Consent

You are being invited to participate in a study which will investigate young adult college students' perceptions and behaviors when searching the Internet for information related to nutrition. The researcher is conducting this study as part of thesis work in pursuit of a Master of Science degree in Dietetics in the Department of Applied Health Sciences. This research is being conducted under the leadership of her thesis committee, chaired by Dr. Lynn Duerr, Ph.D., RD, CD.

There are no known risks for participating in this study, and there are no costs to you for participating in the study. While the data collected may not benefit you directly, the information gathered from this study may assist dietitians and other health professionals in the future better help individuals find beneficial, safe, and comprehensible nutrition information online.

The survey consists of 10 multiple-choice questions and should take approximately 10-15 minutes to complete. Please answer as many questions as you feel comfortable answering. However, failing to answer questions will not penalize you in any way. You are free to stop the survey at any point without penalty. This survey is confidential, and no personally identifiable information will be collected. However, absolute anonymity cannot be guaranteed over the Internet. No one will be able to identify you or your answers. The results of this study will be used for scholarly purposes only. Should the results be published, no individual information will be released.

Your participation in this study is voluntary. By clicking on the web link and completing the survey, you are agreeing to participate. If you have any questions, feel free to contact Brenda Moeckly at bmoeckly@sycamores.indstate.edu, Dr. Duerr at

Lynn.Duerr@indstate.edu, or Indiana State University's Institutional Review Board
(IRB) at ISU-IRB@indstate.edu.

Survey: Young Adult University Students' Perceptions and Behaviors When
Searching for Online Nutrition Information

Q1 What is your age?

- Under 18 years old
- 18-24 years old
- 25-30 years old
- Over 30 years old

If Under 18 years old Is Selected, Then Skip To End of Survey. If Over 30 years old Is Selected, Then Skip To End of Survey

Q2 What level of degree are you currently working toward?

- Associates degree
- Bachelor's degree
- Master's degree
- Doctorate
- Non-degree seeking
- Other _____

Q3 What types of sources do you use when looking for information on nutrition topics?

	Never Use	Use Sometimes	Use Often	Use Most of the Time
Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Magazines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Newspaper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Doctors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nurses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Registered dietitians	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fitness centers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family and Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Articles in scholarly journals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Popular Books	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If Internet - Never Use Is Selected, Then Skip To End of Survey

Q4 What types of Internet sites do you visit when you want to obtain information about nutrition topics?

	Never Visit	Visit Sometimes	Visit Often	Visit Every Time
Blogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussion boards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
News sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scholarly journal databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government health/nutrition websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social networking sites (Facebook, Twitter, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5 For whom are you usually looking for information about nutrition topics?

	Never	Occasionally	Very Often	Always
Myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nobody in particular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q6 Why do you usually look for information about nutrition topics on the Internet?

	Never	Occasionally	Very Often	Always
To learn about general nutrition so that I can lead a healthier lifestyle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To fulfill a class requirement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To diagnose specific problems I or someone I know has been having	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prior to a doctor's appointment, to gain background information and know what questions to ask at the appointment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

