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OMEGA-3 FATTY ACIDS WEBSITE DEVELOPMENT
FOR REGISTERED DIETITIAN EDUCATION AND RESEARCH

By

Martha M. Valverde

A DISSERTATION

Presented to the Faculty of
The Graduate College at the University of Nebraska
In Partial fulfillment of Requirements
For the Degree of Doctor of Philosophy

Major: Interdepartmental Area of Nutrition
Under the Supervision of Professor Nancy M. Lewis

Lincoln, Nebraska

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Omega-3 fatty acids website development for registered dietitians useful for providing
online education and research in the workplace

Martha M. Valverde, Ph.D.

University of Nebraska, 2009

Advisor: Nancy M. Lewis

The purpose of this project was to investigate interest of Midwestern dietitians in online omega-3 fatty acids information and education resources useful within their work setting. Qualitative in-depth interviews with ten registered dietitians, selected from the Nebraska Dietetic Association online membership map were used to identify themes useful in website development. Twelve overarching themes were identified. Valued online features include information that is easy to access, scan, save, print, and send. Findings highlight the need to reformat current online information to accommodate time sensitive search methods used by dietitians. Omega-3 fatty acids learning modules were developed and pilot tested for content, clarity, and online accessibility. Learnomega3rd, Goggle website, was created to house learning modules. An online research survey questionnaire was created using Survey Monkey. These were both pilot tested for content, clarity and online access. Nebraska Dietetic Association email list serve members were invited to visit website, use information to answer their omega-3 fatty acid questions, and provide feedback. Unique website visits resulted in 281 of 520 (54%) visitors to learnomega-3 website. Among those visiting website, 55 (20%) usable survey responses were obtained. Content analysis methodology was used to analyze text responses. Three major omega-3 fatty acid themes were identified by dietitians (known

benefits, best sources, and recommendations). Of 142 questions submitted, 49 frequently asked questions were identified. These provide an online roadmap useful in streamlining quicker access to relevant information. Primary uses for online omega-3 fatty acid information reported include: staying current (82%), medical nutrition therapy counseling (62%), individual education (62%), and group education (51%). Fifty eight percent of respondents were satisfied with time needed to find answers to their omega-3 fatty acid questions using website resources; not being satisfied was associated with inability to locate answers using resources provided. Further exploration is recommended to test usefulness of this website to support dietitians in developing omega-3 fatty acids evidence based guidelines for their work setting.

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Introduction

Development of a professional website for education and research with dietitians in the area of omega-3 fatty acids and human health is the focus of this research project. This involves an understanding of many different disciplines and each of their contributions to providing education and conducting research in an online environment.

The literature review looks at the dietitian audience, conducting online research, online education, working with online communities, and the current research theories, methodologies and available services which can be applied to website education and research. A review of what is currently available online in terms of omega-3 fatty acids nutrition education is reported. A gap is identified in the literature which identifies the interests and needs of dietitians regarding omega-3 fatty acid education. A gap is identified in the literature which also identifies their use and satisfaction with online information sources for decision making in the workplace.

This project addresses the gaps identified using both a qualitative and quantitative approach in two phases. “How dietitians use online information in the workplace, what they consider effective online communications and knowing what influences their decision making behaviors around omega-3 fatty acids” is explored in phase one using qualitative phenomenology research methods. The purpose is to explore how to capture the interests of busy professionals and provide them with omega-3 fatty acids information which will meet their work place needs.

Key findings from qualitative research are used to develop an educational website and online research survey questionnaire which will be further tested by dietitians in

using quantitative research methods in phase two. The process used for developing these instruments is included in Appendix D.

Phase two tests the effectiveness of omega-3 fatty acids website education using a learner centered question based educational approach. How learning is measured is focused on the process of learning with online tools. This study identifies several key elements with dietitians which can be used for creating online learning tools based on dietitian learner centered objectives. These include common terminology, frequently asked questions, and information formatting requests.

Dietitians are key players in producing dietary lifestyle changes which will enhance the health of their clients. Current healthcare arenas provide limited time for the professional for client contact and for education. This website tool is able to provide dietitians with access to current information, tools, and resources which work within their available time frame.

The use of this omega-3 fatty acids website tool which includes a built-in evidenced-based practice format for answering questions is worth further exploration. Further applications for these research findings can be found in Appendix G. Sample website screen shots are included in Appendix H.

REVIEW OF LITERATURE

This literature review highlights current research supporting development of a professional website for education and research with dietitians in the area of omega-3 fatty acids and human health. The first section includes knowing your audience, and understanding their professional environment. The second section includes conducting online research, online education, and working with online communities. The third section reviews the current research theories, methodologies and available services which can be applied to this website education and research project.

A review of the literature is presented which identifies who are registered dietitians, their interests, needs, work environment, and communication style. Then, following is a look at the specialty discipline of Nutrition Informatics recently introduced into the dietetics profession by the American Dietetic Association who supports the dietetic profession at a national level. Conducting online research involves reviewing the literature produced by many different disciplines. This second section highlights key considerations, benefits, and limitations involved with conducting online research. The following are several questions which guide this section of the literature review. What are the best educational approaches to use in an online environment? How is research conducted with online communities? How is success defined and measured? What research methods and research tools are best suited for conducting online research with online communities of interest? How do online website development services and survey development services support conducting quality research? The final section identifies

applications of current theories and methodologies for conducting online research in web based education.

Section One

This research project idea began with the NC 1039 Multi State Research Project – N-3 Polyunsaturated Fatty Acids and Human Health and Disease, and their priority to provide nutrition education for dietitians and consumers around dietary omega-3 fatty acids (1). In 2005, the nutrition education committee within NC 1039 conducted a four state survey of dietitians identifying their current knowledge, practice, and interest in omega-3 fatty acids nutrition education in the work setting (2). Respondents (N=190) were equally distributed among four Midwestern states. Survey findings identified a need for greater knowledge and increased patient nutrition education intervention on the part of dietitians. Dietitian respondents expressed a high interest in receiving further omega-3 fatty acids nutrition education (83%). Educational delivery formats most frequently requested by dietitians included the following in descending order: websites (48%), handouts (40.5%), emails (33.7%), literature (31.6%), brochures and newsletters (30.5%). Institutional Review Board (IRB) approval was obtained following the survey completion to further explore the online nutrition education and performance needs of dietitians in Nebraska with the intent of developing an omega-3 fatty acids website tool useful for dietitians in their work setting.

Know Audience, Dietitians

Literature which looks at characteristics of the dietitian community as a whole, how they currently use computer technology in their work setting, and professional practice needs best supported by computer technology tools is reviewed here. A summary of four key studies conducted with dietitians highlights their online learning and technology needs in the work setting.

In 2001, The British Dietetic Association conducted a survey with a random sample of 200 dietitians selected from their membership database regarding access to and use of the internet, and views on the internet as a potential source of health information (3). Questionnaires were mailed to a selected sample in June and July of 2000 with an initial response rate of 53%. A second copy of questionnaires was mailed to non-responders increasing the response rate to 78% (N = 156). Major demographics reported: 96% female, 94% working in a range of areas employed by the National Health Services (NHS), with 43% having internet access from both work and home. Seventy-one percent had been in their work post greater than five years while 29% were at their post less than 5 years. Findings report dietitians' use of the internet at the time of survey: several times a day (10%), daily (6%), weekly (21%), monthly (22%), and rarely (34%). Forty-three percent of respondents rated their skills using a computer at a 7 or higher on a scale of 0-10 (where 0 = poor and 10 = excellent). The top four reasons reported for using the internet at work in descending order were: work-related research (83%), searching for nutritional information (70%), searching for health information (58%) and communication with colleagues (51%). Fifty-three percent would not recommend internet-based health information services to their clients without knowing more about

them. Respondents rated the following five criteria in order of their importance when recommending a website to a patient: (34%) site was run by health professionals, (32%) site belongs to an accredited organization, (19%) site does not contain biased information (e.g. not run by a commercial organization), (12%) site contained peer-reviewed material, and (3%) site being regularly updated. Six statements were provided assessing how important respondents felt the internet would be in the future for both patients and health professionals on a scale of 0-10 (where 0 = disagree and 10 = agree). “The internet has a role to play in supporting the role of doctors/health professionals” statement received the highest mean rating (6.8). Findings from this study support that dietitians are growing in their comfort level with using computers and the internet in their work setting for research, information searches, professional communications, and patient education.

In 2005, a comprehensive needs assessment, conducted by an independent research company, was undertaken by ADA, the ADA Foundation, and the Commission on Dietetic Registration (CDR) (4). Their primary objective was to better understand the practice and career issues facing dietetics professionals today, identify areas where organizations are currently successful in their support and areas where more support is needed. Questionnaires were mailed during September to November of 2004 to a stratified probability sample of 12,000 dietetics practitioners both ADA members, nonmembers, and ADA student members. Data were collected by mail survey with an option to complete the survey online. Survey questions were primarily quantitative in nature with two open-ended qualitative questions included. A 66% response rate was received (N=7,886). Major demographics were as follows: median age of 45 with 22% under the age of 35 and 17% being 55 or older. Over 90% are female, 85% were white,

5% Asian/Native Hawaiian/Pacific Islander, 3% black/African American, and 3% Hispanic/Latino. Forty-eight percent of RDs had completed an advanced degree (masters, doctorate); virtually all other RDs in the sample had completed the required 4 year degree in dietetics. Employment settings for RDs included: 51% clinical (acute, ambulatory, and long term care), 14% community, 12% education/research, 11% food and nutrition management, and 8% consultation/business practice. The following ADA core membership offerings were rated as most important by 60% or more of respondents: ADA Website, ADA Position Papers, the opportunity for DPG membership, publications/materials for clients, and the ADA Journal. Findings indicated that the ADA Website, ADA Journal, and ADA Journal Online are especially important to student members and newly registered practitioners. Benefits rated highly desirable by 80% or more of respondents not being offered at the time the survey was conducted included: ADA journal articles with free continuing education credits available; additional materials focusing on practice techniques, “how-to’s”, new areas of practice, more materials in lay terms for use with and by consumer, evidence-based guides for practice, low literacy consumer-education materials, and pocket guides for medical nutrition therapy. Respondents were asked in an open-ended question text response format to name the three biggest professional challenges facing dietetics professionals and how an organization like ADA could help meet these challenges. Three broad themes emerged from 11,000 responses. The first broad theme identified was concern with educating the public; helping people to sort through all the information and misinformation available, to identify who is and is not a reliable provider of nutrition expertise, to provide nutrition information in accessible and motivating ways, and to stay current in a quickly changing

arena. Other themes related to improving recognition and respect afforded to RDs by the public and by physicians/other health care professionals and concerns about job security, inadequate reimbursement, and inadequate compensation. Findings from this study support dietitian's value of a professional website, access to journal articles, educational resources, professional dialogue, and support with staying current in a rapidly changing online health information environment. The 2005 and 2007 ADA Compensation & Benefits Surveys reported in the ADA Journal supported similar dietitian membership demographics as reported in the 2004 Needs Assessment Study (5, 6). Major dietitian demographics, work settings, median age, work experience, and educational backgrounds have remained consistent over recent years (1999 to 2007). Recent Compensation and Benefits surveys, however, do not report any findings related to the use of computers or technology within the dietitian work setting.

This next study provides insight on the use of information for clinical decision making within the dietitian work setting (7). The authors highlight and define the use of evidenced-based practice (EBP) as a model of clinical decision-making for dietitians in their work setting as a "systematic process to integrate the best [research] evidence with clinical expertise and patient values to answer a question about one patient's plan of care in order to optimize outcomes." In recent years since this article was published the Evidence Analysis Library has adopted a stronger EBP approach in developing disease-specific practice guidelines and ADA Position Papers (8). Findings state that dietitian's report having availability and access to research literature resources in the workplace which are helpful in clinical decision making. However, frequency of using these resources to conduct literature searches by the majority of respondents is minimal: 17%

never, 33% less than once per month, 19% two times per month, 17% few days per week, 10% once per week, and 3% every day. This study, conducted in 2005, is a cross-sectional, descriptive study of 500 dietitians from seven dietetic practice groups of ADA and was conducted to measure dietitian's perceptions, attitudes, and knowledge of evidence-based practice and to identify which factors most influence these scores. Questionnaires were mailed to a randomly selected sample of dietitians. Usable surveys returned provide a 51.6% response rate (N=258). Major respondent demographics included: 93% white, 97% women, mean age 46-55 (39%), with 35 or younger (22%), 36-45 years (27%), and 56 and older (12%). All possessed bachelor's with 55% having earned their masters or doctorate and their employment settings included: 47% acute care, 20% ambulatory care, 33% other settings. Primary findings related to literature access and use within the work setting indicated: access to bibliographic databases was largely at work, followed by the local library and then home; 57% of participants had never received formal training in search strategy; 55% had received training in critical appraisal, mostly by way of graduate education; and 64% had never attended a presentation on the principles of EBP.

The three most commonly cited barriers for applying research findings to practice included: lack of resources (e.g., time, money, or staffing) 18%, poor organizational culture 15%, and unsupportive health care team members 14%. "Lack of time" was perceived as the top barrier for integrating research into practice. RDs recognized the value of research for practice, but lacked time and ability to critically read research. Respondents reported the best methods for moving forward towards EBP included: using EBP guidelines or protocols (35%), seeking and applying evidence-based summaries

(28%), and learning the skills of EBP (27%). Inaccessibility to resources (primarily in the workplace) did not seem to be the explanation for the infrequent searches, but rather a lack of knowledge or awareness about them and limited time and skill to take advantage of them according to the authors.

Primary recommendations made by authors were to include EBP into didactic education which includes the following four steps:

Step One: formulate a clear, concise clinical question to explore

Step Two: teach how to search the research literature effectively to answer the question identified

Step Three: provide criteria for critically appraising the research literature located as well as evaluating the strength of existing evidence to answer the stated clinical question

Step Four: determining whether the research evidence supports a change in practice

Authors' recommendations for dietetic practitioners were that resources for dietetic practitioners should include the following: articles; publications; online bibliographic and library databases; and workshops and continuing education courses that address EBP techniques, key research concepts, and statistics.

This final study highlights dietitians in community settings and their use of outcomes based nutrition services with clients (9). In 2004, a qualitative study of 24 New York dietitians, using a grounded theory approach, was conducted to look at community setting dietitian practice satisfactions and challenges. Purposeful sampling was used to select

community dietitians from a variety of practice settings, with an equal mix of rural and urban, who provided individual nutrition services to adults. Practitioners were recruited until no new themes emerged from interviews and theoretical saturation was achieved. Primary demographics indicated: median age to be 41-53 (50%), with 25% in the 20-30 years group, 25% in the 31-40 years group. One-third had a bachelors degree and two-thirds a masters degree. Practice experience indicated 33% had 10 years or less, 42% 11-20 years, and 25% more than 20 years. All respondents were white, all but one were female.

Primary practice satisfactions experienced included: positive interactions and measurable outcomes of work with clients and coworkers, recognition for expert and helper roles, and involvement in disease prevention.

Primary practice challenges experienced included: others' misunderstandings of the dietary change process, assessment of practice outcomes, others' respect for expertise, keeping up-to-date, client and coworker expectations, isolation from peers, and the food environment.

Primary frustrations included: insufficient time to implement practice ideals or to show positive outcomes of practice, difficulty of monitoring, evaluating, and documenting outcomes of dietetics practice, lack of time and limited client contact influencing these frustrations. Conflict was experienced by respondents in trying to find a balance between supports for client's learning and the need to document change.

Survey findings from the four studies just reviewed highlight the needs of the dietitian in all work place settings were as follows: online access to information through credible websites, developed patient education materials, developed recommendations and practice guidelines, dialogue in online professional community settings, access to peer reviewed journal articles for free, access to continuing education units from reading articles for free. Dietitians are well educated, able to read current research literature, develop nutrition education materials, and formulate relevant recommendations. Further training in effective information search strategies is connected primarily to graduate school experiences. Time constraints may limit the use of an evidence-based practice approach by dietitians in their work setting.

A review of what is currently available in the area of online omega-3 fatty acids nutrition education resources for the professional and consumer was conducted. This review is reported in Tables 1 and Table 2. The search methods used to conduct online review included: Google, Yahoo, and WebMD keyword searches using “omega-3 fatty acids”; online website references provided by nutrition omega-3 fatty acids field experts; and Pub Med journal article key word searches using “omega-3 fatty acids.”

The following is a summary of the resources that were identified during the online search: peer reviewed research articles with limited access based on journal membership and fee per article costs; free online professional nutrition education with CEU’s available for cost; some guidelines and recommendations available for specific health conditions benefitting from omega-3 fatty acids intake; limited audience specific patient education materials; and limited evidenced based recommendations and materials in one location which supports evidenced based practice decision making process.

Nutrition Informatics

Where is the nutrition field in terms of adopting computer technology in the work place based in the research? Two articles published in the ADA Journal address answers to this question. The first article published reviews computer use in the dietitian workplace from the 1960's to present. The second article shares results from the ADA Nutrition Informatics Member Survey conducted in 2007.

Movement towards a paperless medical health care system which uses an electronic health care record is being adopted by all healthcare providers and has spurred the nutrition community to create a nutrition informatics specialty patterned after medical, health, and nursing informatics specialties which are already in motion. In 2006, the term nutrition informatics was introduced to the dietetic community, *“Nutrition Informatics - the specialty in the field of human nutrition and dietetics that integrates science, evidence-based practice, research, computer knowledge, and expertise in electronic information systems for the purpose of supporting optimal nutritional status and health.”*(10)

Key concepts in the field of informatics as identified by the nursing informatics specialty include: data, information, knowledge, and wisdom (11). These are defined below and necessary in building an operating structure for the field of nutrition informatics in the future:

Data – discrete entities described objectively without interpretation

Information – data that is interpreted, organized, analyzed, or structured

Knowledge – information that is synthesized so that relationships are identified and formalized. Knowledge depends on experience and observation of like situations coupled with expert nutrition research.

Wisdom – the ability to appropriately integrate data, information, and knowledge with professional values when managing specific human problems.

Hogle, Michael, and Ayres stressed, “When defining nutrition informatics, it is critical to understand that it is an applied science. Computers and information technology alone do not support quality patient care.” (10)

A review of the literature by Hogle, Michael, and Ayres shows computer and electronic media use by dietetic professionals for nutrition tasks since the 1960’s (10). Primary uses reported relate more to work benefits versus functional tasks performed, i.e. help decrease costs, eliminate task redundancy, and increase efficiency. Housing data based files for master menus and nutrient data items were primary functional tasks reported. In 1990, Microsoft Windows operating systems became available allowing for user friendly nutrition-specific software development which continues to be available today in the work place. Primary computer use focus areas in the field of dietetics reported by the authors included: inventory management systems, nutrient analyses, nutrition research, clinical nutrition care, foodservice systems management, educational/instructional/data intake, reimbursement for nutritional care, communication, and food-supply surveillance.

The authors suggest further development of the nutrition informatics specialty to professional practice in the transition towards an electronic health record system. This would involve using electronic communications for charting nutrition notes, communicating with other health care providers, reviewing patient records, creating a nutrition standardized language/vocabulary, conducting nutrition research and training within electronic health care systems. Authors conclude, "...all dietetics professionals must develop at least a basic level of competency regarding information systems, data integration, and application so that they may continue to lead consumers and other health professionals in understanding nutrition research and available nutrition information" (10).

In 2007, the Nutrition Informatics Work Group appointed by the ADA Board of Directors to examine the state of nutrition informatics across the practice of dietetics, conducted a survey of ADA members as part of their efforts (12). The primary objective was to determine the extent of member utilization of technology for creation, retrieval, analysis, and sharing of information. The nutrition informatics definition used for the survey was, "*the effective retrieval, organization, storage, and optimum use of information, data, and knowledge for food and nutrition-related problem solving and decision making...*" Questions being asked included: What are the types of technology applications being used by ADA members? What is their comfort with use? What is their professional involvement with technology? An invitation to participate in the electronic survey was successfully emailed to 85% of the total ADA membership (55,063) in November and December of 2007. The survey link was housed within email invitation message. Two additional email reminders were sent following the initial

invitation. Usable survey responses received totaled 11, 223, which is a 20.4% response rate. All classes within ADA membership were included in the survey invitation.

Primary demographics reports 80% of respondents were currently employed in dietetics-related positions. The median age was 50-54 years (16%) with 14% in the 25-29 years, 12% in the 45-49 years, and 12% under 25 years. Educational background included: 2% associate, 7% student, 44% bachelors, 42% masters, and 5% doctorate. Respondents were 96.8% female. Primary practice areas included: 36% clinical, 13% community, 10% food and nutrition management, 10% student, 8% consultation/business, 8% education, 3% research, 3% dietetic intern, and 10% other.

Technology Access findings: Internet access was available to 91.5% of respondents in primary work setting. Most frequently used information sources included: materials for continuing education, patient education, and standards of practice.

Primary information formatting used by respondents included: electronic, printed, and verbal information formatting. The following are uses of each format by respondents:

Electronic information sources: electronic databases 82%, Evidence Analysis Library 81%, recipes 78%, drug information 72%, professional journals 69%, continuing professional education 69%, and patient education materials 68%.

Paper-based information: textbooks 79%, professional journals 78%, patient educational materials 70%, lay literature 58%, recipes 55% and diet manual/nutrition care manuals 53%

Verbal information (defined as information access through colleague, presentation, webinar, or podcast): mainly used for continuing professional education 63%

Respondents indicated a high level of comfort with email, web/internet, office applications, and nutritional assessment applications. This is evidenced by primary technology/computer applications reported: email (97.8%) and web/internet (98.4%) used on a regular basis (daily/weekly/monthly) to support practice; electronic document management tools (94%) such as word processing, spreadsheets, and slides; electronic data analysis tools (79%); for clinical respondents 70% electronic clinical management tools(screening, assessment, diet office management), and 57% electronic health records (patient information, lab results, or clinical documentation).

Respondents requested education/training for the following: nutrient analysis 40%, nutrition assessment 40%, podcasts 33%, webinars 33%, nutrient databases 32%, nutrition screening 31%, and generating graphics 28%. Use of ADA Standardized Language in practice is limited as findings report: 32% are familiar with language, 16% use nutrition diagnostic terms, 13% use intervention terms, 11% use monitoring and evaluation terms, and 49% did not respond to survey question. Five percent of respondents reported responsibilities for web site development or web site management.

Respondents were asked to identify all personal and workplace barriers to using technology. *Primary personal barriers reported were:* no personal barriers to using technology (64%); not needed to use technology (14%); not enough time to learn technology (14%); employer does not require use of technology (14%); no training

available (12%); and too inexperienced to use technology (7%). *Primary workplace barriers reported were:* no workplace barriers (62%); no access to computer in workplace (3%); employer does not require use of information technology (14%); employer does not offer training (10%); and inadequate staffing to implement and maintain information technology (11%). *Benefits of technology for practice included:* access to information (95%), access to research (91%), and communication (91%). Other benefits reported include: reduce or prevent errors (80%), performance improvement (79%), time management (79%), help with workflow efficiency (73%), and patient safety (58%).

The majority of respondents indicated need for additional educational resources to support the use of information technology. Educational resources specifically requested included: journal articles, reference materials, and professional development sessions on technology and nutrition informatics.

Conclusions and recommendations made by the authors of the Nutrition Informatics Work Group were, “Registered dietitians need to understand how to access and use electronic health care and food related information... [To] remain a viable part of the health care team of the future”; and “Practitioners need to become proficient with retrieving and using electronic information.” The authors also concluded, “The concept of informatics does not seem to be well understood despite the broad use of common technologies by most respondents as indicated by the responses ‘access to information in an electronic format’ and ‘use of technology for my practice’.” (12)

In summary, nutrition informatics applied to website development and dietitian's primary uses of technology for practice involved: access to information, access to research, and professional communication as reported in the Nutrition Informatics ADA Membership survey. Electronic information sources used by the majority of respondents included: electronic databases, Evidence Analysis Library, recipes, drug information, professional journals, continuing professional education, and patient education materials. Paper based information sources used by the majority of respondents (becoming widely available in both electronic and printable formats) included: textbooks, professional journals, patient educational materials, lay literature, recipes, and diet manual/nutrition care manuals. The verbal information format (primarily for continuing professional education) included technology mediated access routes such as webinars and podcasts within its assigned survey definition.

Dietitians would welcome and be comfortable using website tools which streamline access to information and research, and facilitate professional communication within their work place based on the Nutrition Informatics Survey results.

Section Two

Constructs, Dimensions, Online Education

This section reviews the literature on conducting online research with the goal to identify the definitions, structures, and approaches for working in an online environment to provide education and conduct research with dietitians in their work setting.

When conducting research with computer based learning approaches, what does the current literature say are the relevant concerns? This first article provides insight into current research with online learning approaches in the present day (13). This introduces the following research terms used by researchers with computer based learning such as computer based instruction, computer based learning systems, and computer aided learning. Research over the past 30 years has involved studies with computer-based instruction (CBI) as it relates to effectiveness, design, and individual differences mostly based on outcomes. Current research studies are looking at research on emerging computer-based learning systems, and research questions related to the future of computer-aided learning. The author's conclusions focus more on the process than outcomes as reflected in the following statement, "The greatest difference between contemporary and traditional technology research is the shift to thinking and learning processes versus outcomes. Research has evolved to emphasize learning with media and developing technology to support and optimize thinking, learning, and teaching processes." (13)

The following research questions, terms, and issues that are relevant to website development for professional education and research are addressed by the authors. They relate to terminology, approach, and philosophy. Current research developments include user-centered learning, open-ended learning, and hypermedia. Researchers have been asking, "If" computers are effective in promoting learning. A question needing asked is, "How best [can we] utilize them to redefine, support, or compliment teaching and/or learning efforts?" When using an approach to facilitate learner-centered controls within the online environment two key questions are: 1) "How can the unique intents of

each learner be supported?” and 2) “How can systems be created capable of supporting needs and intents that cannot be fully known in advance?” The authors’ state, “Research with technology focuses on how human processing changes in distinct, qualitative ways when an individual is engaged in an intellectual activity using the computer as a tool.”

(13) And authors conclude by stating, “An emphasis on learning with media, as opposed to learning from media is proposed for help in resolving some of the controversies surrounding media research over the past 50 years.”

Research looking at published studies focused on internet based learning for professionals within the health profession was recently published in the Journal of the American Medical Association (JAMA) September 2008 (14). A systematic review of the literature from 1990 to 2007 identified 201 studies used in this meta-analysis report. Major findings as summarized below support the changing focus happening in research being conducted with online learning:

- Synthesized evidence demonstrates that Internet-based instruction is associated with favorable outcomes across a wide variety of learners, learning contexts, clinical topics, and learning outcomes.
- Internet-based instruction appears to have a large effect compared with no intervention and appears to have effectiveness similar to traditional methods.
- Internet-based interventions against no-intervention comparison groups answered “yes” almost invariably when asked whether a web-based course in a particular topic could be effective.

- Studies making comparisons to alternate instructional media asked whether internet-based learning is superior to (or inferior to) traditional methods. Answers varied widely, magnitude of pooled estimates favoring internet-based instruction was small. Findings support arguments that computer-assisted instruction is neither inherently superior to nor inferior to traditional methods.
- Inconsistency in effect across both study types suggest that some methods of implementing an internet-based course may be more effective than others.
 - Researchers propose greater attention be given to the question, “How can internet-based learning be effectively implemented? This question will be answered most efficiently through research directly comparing different Internet-based interventions.
 - Researchers state, inconsistency may also be due to different learning contexts and objectives, and thus the question, “When internet-based learning should be used?” should be considered as well. (14)

A review of “Learner-Centered Education” as a philosophical approach to providing education is described in this next article (15). What are the key ideas involved? What dimensions are used by which to evaluate learning? What are best applications of this approach?

Key words associated with learner-center education include: constructivism, learner-centered, and problem-based. Constructivism includes the views of learners in defining what is essential for learning on a particular topic of interest for education. The central theme of this approach according to the authors' is, "the idea that people learn best when engrossed in the topic, motivated to seek out new knowledge and skills because they need them in order to solve the problem at hand." (15) This approach is not focused on content but rather on the needs, skills, and interests of learner. It is often accompanied by a problem-based approach, where the problems are picked to fit the interests and needs of the learners. Newer technologies allow greater flexibility in creating problem solving scenarios and structuring information linkages relevant to problem solving. This learning style is suitable for the online learning environment which uses current technology applications.

There are three primary dimensions of instruction with learner-centered education: engagement, effectiveness, and viability. Following each is a brief description of the dimension:

- Engagement – An engaged student is a motivated student.
Correlations to motivation include: time on task, computer-based instruction providing instant feedback and interaction to student enhancing engagement; engagement mediated by choice of topic, major themes of problem-based education is to use the problem as the primary motivating force.
- Effectiveness – Major concern with traditional teaching methods, "How much do students learn?" [i.e. topics of concern/focus].

Traditional measures – test scores. These measure declarative knowledge: learned recitations and applications to small problems. They don't address depth of understanding or the skills students have acquired.

- Viability – things critical to widespread viability outside pilot classroom are listed here. Viability defined as: able to scale to meet curriculum needs, large numbers of students; diverse content areas, everyday teachers and students rather than handpicked ones; technology support practice, cost prohibitive; social and cultural infrastructure required to make it work; authoring tools, designing tools, component software standards, improved distribution infrastructure, integration into existing classroom activities

Applications of a learner-centered approach to education are most effective for providing a solid conceptual understanding of a topic through engagement, motivation, and a problem-driven format. This design addresses the need for learner engagement. Limitations of this approach come in measuring effectiveness and viability which are important for other stakeholders in the learning arena. Assessment of effectiveness is limited to the opinions of students and teachers. A conventional assessment relying on answering of questions in a rigidly controlled examination format is not necessarily the answer. Viability is the most difficult dimension to assess as it depends upon social, cultural, and political issues as much as on evidence of engagement and effectiveness.

Arizona Health Sciences Library created a customized search engine largely designed to clinical users' specifications (16). This tool permits independent searching of

content specified by clinical users. It aggregates key online resource databases used by these clinicians for answering patient clinical care questions in an evidence-based fashion. It repackages and creates web links to information sources providing current research information needed in decision making. This meets the clinical users' need for immediate and simplified access to excellent resources to enhance knowledge transfer in the busy clinical environment where patient care occurs and evidence-based decision making happens in a time constrained environment. They focused on aggregating and delivering packages of key resource subsets via a search engine. This search engine interface was then available on computer desktop within clinical care setting near where patient care occurs.

Three primary stakeholders within the organization are involved creating this customized online search tool for clinical specialty subsets: the reference librarian, clinical care provider representatives, and the systems management representative. A summary of the development process steps taken to create this customized search tool follows:

1. Reference librarian conducts a needs assessment of target user environment, typical information seeking behaviors, and researching of relevant library science and medical literature.
2. A preliminary list of resources considered valuable by target group is compiled. Reference librarian creates search strategies for retrieving subset of content that accommodates the typical, broad needs of the target group.

3. These search strategies are built into web-based search tool for clinical subset by systems management representative making the search a permanent part of a web-based search or navigational tool.
4. Marketing: library systems professionals are provided a compilation of target users needs assessment information to gain their support for further development of customized clinical subset search tools more powerful and convenient for users.
5. Marketing: clinician representative (having clinical exposure, experience and training in statistical research design) takes responsibility to critically appraise and interpret the medical literature, then facilitate the transfer of this knowledge to the clinician treating the patient.
6. Marketing: users actively engage in the process by contributing fundamental knowledge about the context of the information need, obstacles influencing one's ability to find answers, and later, feedback about the success or failure of tested solutions.
7. Establishing ownership: of customized online search tool
 - How to involve clinical users? It is crucial to establish trust, gained simply by convincing them that the goal is to improve their work lives.
 - Use of Relationship Management (RM) business concept – refers to the process of acquiring, retaining and partnering with selective customers to create superior value for the company

and the customer. This business concept referenced in article and applied to this development project.

The questions of, “How is evidence-based practice (EBP) education being evaluated?” is the subject of this next article review (17). Various instruments which measure EBP domains are discussed at length in this article. Most helpful is the description of variables and terminology providing standardization across studies. EBP domains described include: knowledge, skills, attitude, and behaviors. The EBP domain relating to skills is the most helpful for website design applications to the omega-3 fatty acids topic as related to health benefits focus within dietitian work setting. Article descriptions of evidence based skills are presented below:

EBP Skills: EBP skills are distinguished from knowledge by participants *applying* their knowledge by performing EBP steps in some type of clinical scenario, such as with a standardized patient, written case, computer simulation, OSCE, or direct observation.

- Ask: Converting the need for information (about prevention, diagnosis, prognosis, therapy, causation, etc) into an answerable question
- Acquire: Tracking down the best evidence with which to answer that question
- Appraise: Critically appraising that evidence for its validity (closeness to the truth), impact (size of the effect), and applicability (usefulness in one’s own clinical practice)

- Apply: Applying the evidence in clinical decision making (includes both individualizing the evidence [such as recasting number needed to treat for the patient's baseline risk] and integrating the evidence with the patient's preferences and particular clinical circumstances)

This final article from nursing research provides a context for the current environmental picture of evidence-based practice within the nursing profession (18). What are the issues? What needs clarification? Where would additional supports be helpful? These findings could provide insight into the environment within which dietitians are also working. Following is a summary of highlights which are also applicable to dietitians in the healthcare work setting.

The author states several messages presented in today's literature regarding terminology used to describe applications of evidenced based practice in the work place are confusing (what does EBP really look like?). Clarification is provided by the author stating, "Evidence-based practice not only uses systematically generated evidence from research but also evidence stemming from clinical expertise and from patient preferences." A gap between research and practice still exists according to the author, "nurses tend to use consultation with colleagues as their primary source of information about practice and do not look for evidence from research to help with decision making." There are no clear answers as to why this is the case. Several models of translating knowledge into practice have been developed. The author reviews common steps in the process used by all models as summarized below.

Formulating the appropriate question – the question must include the specific topic of interest, which might be an intervention; the population to which it applies; any comparisons to be made; and the possible outcomes

Finding the evidence – this step may be the one that is most problematic to clinical practice. The evidence must be readily available and quickly accessible to be of use in nursing practice. New technology will provide instant access to research findings in ways that can be available in clinical settings. This will be an increasingly popular way to ensure that the evidence is accessible

Evaluating the level and strength of the evidence – Once the evidence has been compiled, the level and strength must be assessed before it can be applied in practice. Most experts recommend the Cochrane method of assessing evidence, which ranks it into levels of evidence. Randomized controlled clinical trials are considered to be the highest level. Studies with lesser controls built into the design are given lower rankings (this would include most nursing studies).

Guideline development and adaptation – Evidenced-based clinical guidelines should be examined to determine how the evidence on which they were based was evaluated. Then a decision can be made as to whether these are relevant to the situation at hand. Several systems are available for such appraisals such as the Appraisal of Guidelines Research and Evaluation Instrument (AGREE) developed in 2001 (referenced in article references).

Implementing and evaluating the result – Whenever clinical practice guidelines are implemented, there must be a plan in place to evaluate the results. Major

change is involved in successful implementation – consulting change theory for help in assessing this process is recommended. Measurement of outcomes must be included to assess the value of the guidelines in improving patient health and organizational factors such as cost. Part of the implementation is to ensure measurement of these factors.

The author concludes by asking, “How will we know when the nursing profession has achieved evidence-based practice in all clinical settings?” The author responds by answering, “We should see specific guidelines for clinical practice based on systematic reviews of the research literature.”

Omega-3 fatty acids EBP guidelines for dietitians are available through the Evidence Analysis Library for disorders of lipid metabolism (8). Guidelines for each health condition benefiting from dietary intake of omega-3 fatty acids are not available.

Online Communities, Online Research Surveys

This next section looks at issues related to conducting online research within online communities. How does one distinguish quality online research study reports? What are the advantages and disadvantages of using online research surveys? How do online communities respond to researchers’ request for participation? Are response rates for online surveys comparable to mail surveys? Is the recruitment process similar for online versus mail survey research? These are some of the questions addressed by a review of literature in this section.

What does a good survey research report look like? This first article reviews best practices for survey research reports (19). It discusses what quality research published in the peer-reviewed literature should look like. Poor quality online research reports are attributed to two primary issues: ineffective reporting of sufficiently rigorous survey research, and poorly designed and/or executed survey research, regardless of the reporting quality. The standards for rigor in design, conduct and reporting of survey research should be equivalent for creation and dissemination of scientific evidence in all health related disciplines.

The authors provide a checklist and recommendations for authors and reviewers to use when submitting or evaluating manuscripts reporting survey research that used a questionnaire as the primary data collection tool. They are only considering mail, e-mail, and internet-based data collection approaches in this review.

Clarification of the term *survey* is, “reserved to describe the research method whereas a questionnaire or survey instrument is the data collection tool. *Survey* and *questionnaire* are not used interchangeably.” Readers are made aware of the many text and reference books, guidelines, position statements, and best practices are available in print and via internet. However, authors conclude that these materials are not always consulted and applied. They state, “There’s a false impression that conducting survey research is relatively easy.” (19)

A modified version of the 10 guiding questions, listed below, established in the *Best Practices for Survey and Public Opinion Research* by the American Association for

Public Opinion Research (AAPOR) is used by authors to discuss quality issues in online reporting as related to each area. (20)

1. Was there a clearly defined research question?
2. Did the authors select samples that well represent the population to be studied?
3. Did the authors use designs that balance costs with errors?
4. Did the authors describe the research instrument?
5. Was the instrument pretested?
6. Were quality control measures described?
7. Was the response rate sufficient to enable generalizing the results to the target population?
8. Were the statistical, analytic, and reporting techniques appropriate to the data collected?
9. Was evidence of ethical treatment of human subjects provided?
10. Were the authors transparent to ensure evaluation and replication?

In summary, good research involves the same elements of rigor in all steps of the process regardless of research methods being used. A reference checklist of questions which evaluates each of these 10 points is included with article appendix.

These next two articles review the practical aspects of web-based survey development, administration and reporting processes used in conducting online research

(21, 22). The first author, Gunn (21), walks reader through each step in the process of research and highlights what research shows is most effective in producing quality research results. The author provides several checklists for readers to follow with each step in the process. Findings which are based on a review of available research for both studies are complimentary of one another. Below are highlighted discussions on the important issues to consider with online communities and online research according to Wright, the second author (22).

Advantages with online research include: access to individuals in distant locations, the ability to reach difficult to contact participants, and the convenience of having automated data collection, which reduces researcher time and effort.

Disadvantages with online research include: uncertainty over the validity of the data and sampling issues, and concerns surrounding the design, implementation, and evaluation of the online survey.

Defining Online Populations – A virtual community is an internet-based community located online, having boundaries, and sharing specific interests, attitudes, beliefs, and values regarding an issue, problem, or activity.

Addressing Time Advantages – Online research allows researcher to reach thousands of people with common characteristics in a short amount of time, despite possibly being separated by great geographic distances. Data collection time: once an invitation to participate in a survey is posted to the website of a community of interest, emailed to people through a listserv service, or distributed through an online survey research service, researchers may collect data while working on other projects.

Researchers are able to begin preliminary data analysis with initial data collected while waiting for the desired number of responses to accumulate. Processing software packages now offer several templates which allow exporting of data to statistical software packages commonly used by researchers.

Costs Savings – Online survey creation, administration, and data collection services relatively inexpensive compared to traditional paper-and-pencil surveys cost of postage, printing, and data entry.

Sampling Issues – There are several concerns with sampling:

- Accuracy of demographics of population sample; self-reported
- Email list serves with no access to email addresses make it difficult for researcher to accurately size online population. Tracking responses, multiple email addresses for the same person, multiple responses from participants, and invalid/inactive email addresses make random sampling online a problematic method in many circumstances.
- Establishing a sampling frame: unlike membership-based organizations, many online communities do not typically provide participant email addresses. Membership is based on common interests, not fees, and little information is required when registering to use these communities. Internet communities are becoming more stable, compiling statistics on their community participants, and willing to share some aggregate statistics about community

membership with researcher. However there is no guarantee of accuracy.

- Are online responses to surveys similar to paper versions of the same survey?
- Non-response rate tracking is difficult to ascertain in most large online communities. Financial incentives are helpful
- Self-selection bias is difficult to manage, why some respond to invitation to participate and others do not. How, where, and when invitation to participate is posted?
- ****Best defense against deception that researcher may have is replication. Only by conducting multiple online surveys with the same or similar types of Internet communities can researchers gain a reliable picture of the characteristic of online survey participants.**

Access Issues – Working with web community administrators and participants when proposing a study idea. Seeking permission from the community and taking time to explain the purpose of the study might help a researcher to gain access. Email research invitation seen as advertising, spam, invasion of privacy. Ways to foster “good will” between researcher and community participants are listed below:

- Create a study report, highlight most interesting results to the online community audience
- Provide contact information about the study, researcher credentials, IRB approval to enhance credibility of survey. This can also create opportunities for email interaction between the researcher and

participants. However, the downside is that it's becoming a target for abusive individuals who resent invasion of privacy on the internet and find online surveys offensive.

Current Web Survey Software Packages and Online Survey-Related Services – the author provides a list of the top twenty more prominent online service companies provided with web addresses. Included is the comparison of features, pricing issues and service limitations. Web survey services have facilitated the process of creating and conducting online surveys. However, they don't minimize or take away the limitations to be considered with online survey research as a method. The issues to consider include: sampling frames, response rates, participant deception, and access to populations. Main considerations with using services include:

Online questionnaire – using versus owning software to create and conduct online surveys; paying for upgrades versus paying a monthly service fee; writing your own surveys versus using templates and modifying; use of multimedia requiring increased download times for participants yet providing visual and audio messages more acceptable to audiences.

Data collection and analysis – ability to export survey responses to statistical software packages such as SAS and SPSS; ability to share data with other researchers on team; technical support of software Service Company with their products and services. Help with administration of survey using multimodal methods of administration.

Pricing – knowing what you need and matching services provided with what you need within your price range. Consider the time, space, and number of responses allowed for a given price. Consider technical support needed.

These next three articles deal with research being done with online survey response rates. What is useful in these studies, in addition to the research findings, is each author's perspective on what issues are important to consider when talking about response rates in online research.

The first article compares response rates to web and mail surveys when the audience is held constant (23). Issues highlighted by authors include: whether to use mixed-mode survey strategy (e.g., mail surveys and Web surveys) or to select among alternative survey modes. The authors state, researchers must understand and demonstrate the equivalency and complementarities, or relative strengths of alternative modes. Survey response rates have been used by researchers as one measure of equivalency. Differences in response rates for Web surveys and mail surveys have many causes or explanations. The authors provide one explanation as amount of time spent developing and testing motivating tools to increase Web survey response compared to that done with mail surveys. Particular mention is made to the widely followed elements of the "tailored design method" for mail surveys attributed to Dillman (29). Implementation approaches that are beneficial for mail surveys may not translate directly to response rate benefits for Web surveys (i.e., receipt of junk mail or spam; internet security).

This research study took place at Michigan State University (MSU) as part of a larger research effort. Researchers were asking, what elements influence online survey response rates the most as compared to mail survey response rates in a population having convenient access to web based communications? It involved the student population of MSU (N=19,890), undergraduate, graduate and professional. Five random student samples were provided to researchers by the registrar's office for academic year 2001-2002 along with their name, mailing address and e-mail address. Each group was assigned a different distribution mode as follows:

Group 1: hard copy, tailored design approach (4 contacts, preliminary postcard, hard copy survey, follow-up reminder postcard, replacement hard copy survey)

Group 2: postcard/email

Group 3: postcard/email/postcard

Group 4: email/postcard

Group 5: email only

Findings show there was a significant difference at the $p < 0.05$ level in mean age of respondents in four Web groups (24.24 years old) as compared to mail survey respondents mean age (30.55 years old). Other MSU data reflective of the student population during survey period shows that 80% of MSU students were 24 years of age or younger. All other response characteristics of groups were roughly equivalent with no significant differences.

The response rates (RR) and calculated costs of each group are reported below.

What I find interesting is the range of response rates being 20.7% to 31.5% in a population familiar with using email communications: mail survey 31.5%, pre notification/email survey 29.7%, pre and post card with email survey 28.6%, email/post card follow up 25.4%, and email survey only 20.7%. The cost estimates do not include survey design, evaluation, pretesting, and data entry costs as these costs were roughly equal across implementation modes.

Group 1: mail, N=2594, RR=.315, (SD = .464), \$10.97/response

Group 2: postcard/email, N=4327, RR=.297, (SD = .457), \$1.31/response

Group 3: postcard/email/postcard, N=4178, RR=.286, (SD = .452),
\$1.80/response

Group 4: email/postcard, N=4351, RR .254, (SD = .435), \$1.53/response

Group 5: email only, N=4440, RR=.207, (SD = .405), \$1.32/response

A one-way analysis of variance revealed a significant effect of treatment on response rate. However nonlinear correlation indicates this difference in rates to be relatively small. A clear, significant separation between groups receiving pre-survey postcards and groups that did not is shown ($F = 84.40$, $df = 1$, $p < .05$).

The authors conclude that Web survey application achieved a comparable response rate to a mail hard copy questionnaire when both were preceded by an advance mail notification. The cost differential between the mailed hard copy questionnaire treatment and the Web survey treatments with mailed advance notice was substantial

(i.e., \$10.00 to \$2.00). The cost advantage of a mail notification/web questionnaire delivery combination suggests that this approach may be beneficial for studying populations with full access to the Internet.

This next article looks at the impact of paper and email contacts on web survey response rates (24). Respondents were not given an option of survey format. Testing is done only with regards to various survey delivery and follow-up approaches and which produce the best response rates. Six combinations of paper and email pre notifications and reminders were used. Two survey samples differing in their relationship with the sponsoring institution were used to test if the impact of contact mode is conditional on relationship between respondents and the survey researchers. The authors conclude stating they find little difference in response rates across experimental groups.

This research study conducted during spring/fall semesters 2004 with the first sample 3,000 high school students who had contacted selected liberal arts college for information but did not apply. Previous response rates with this population yielded around 15%. The second sample consisted of 3,000 alumni who had graduated from this institution during the past 10 years. Previous response rates with this population yielded around 60%. Groups contained combinations of pre notification via postal mail, via email and no pre notification and reminder follow up via postal mail or email. Non respondents in all groups received an additional two reminder emails. Analysis included both viewing the survey and completing the survey. Authors state that some aspect of email contact may encourage someone to click through to the survey, but some aspect of the survey (such as the content), may cause the person to decline filling out the survey. Therefore, authors state click through rates as well as response rates as an important

measure of the effectiveness of the email contact. Results for click through rates in the weak relationship population groups ranged from 19.4% to 26.2% with no pre notification to those receiving pre notifications, respectively. Response rates followed a similar trend with no pre notification and with pre notification being 14.8% and 21.4%. In the strong relationship group, click through rates were 58.7% to 64.5% based on pre notification or no pre notification; and response rates ranged from 55.3% to 62.9% based on pre notification or no pre notification. Modes of contact had consistent effects on survey participation across the two populations. Main effect for relationship was due to the higher click-to-URL rate achieved in the alumni survey than in the non-applicant survey (61.7% and 21.7%, respectively). In terms of paper versus email pre notification, results did not yield significant differences in response rates relative to cost savings of email to paper mailing according to authors.

This last article is a meta-analysis of research studies found in the literature between 1990 and 2007 which compare response rates from web and mail surveys (25). The Meta analysis showed that web survey modes generally have lower response rates (about 10% lower on the average) than mail survey modes. And further analysis suggests that two study features (i.e., population types and follow-up reminders) could statistically account for some variation of web and paper survey response rate differences observed in these comparative studies.

Research questions asked in this meta-analysis included: 1) what the observed response rate differences are between web and mail surveys, as shown in the comparative studies that directly compare these two survey modes, and 2) how different study features can explain the inconsistent findings about response rate differences across different

studies. Eligible studies included 201 studies. A descriptive analysis of these studies shows: mean sample size 2,616; response rates for web survey: Mean=0.34, SD=0.22, Min=0.07, Max=0.88; response rates for paper survey: Mean=0.45, SD=0.20, Min=0.10, Max=0.89; response rate differences (d): Mean=-0.10, SD=0.19, Min=-0.54, Max=0.23.

Findings indicated a 27% of variance in effect size across studies associated with population type. College populations responded higher to web surveys versus mail surveys by 3%. Professionals, employees, and the general population responded lower to web surveys versus mail surveys by 23%, 10%, and 13% respectively (weighted d). The authors conclude stating web surveys require that respondents feel reasonably comfortable with internet technology. College populations have easiest access to internet technology and are probably the most technologically savvy, thus preferring web surveys over email surveys. Non college populations, including those with sufficient educational and professional training, e.g., doctors, schoolteachers, showed considerable preference for mail surveys over web surveys.

Researchers report a statistically significant association with the variation of response rate differences accounting for about 10% of variance in effect size across studies. Surveys not using follow up reminders show response rate differences of 4% in favor of mail survey response versus web survey response. Surveys using follow up reminders (one or more) show a 14% response rate difference in favor of mail over web survey response. Follow-up reminders did increase response rates for both web and mail survey modes, but they were more effective for mail surveys and less effective for web surveys, thus resulting in a larger response rate difference between web and mail surveys.

Section Three

Methods, Tools, Services

This next section reviews current research theories, methodologies and available services useful in developing this website education and research project.

Theories supporting a web based approach to learning online come from several different disciplines including business, visual design, technology, and education. Each discipline provides domains in which to develop, test, and evaluate the effectiveness of websites and their role in providing learning interventions for consumers interested in omega-3 fatty acids.

The Long Tail Theory created for business describes Internet's role in reshaping market place dynamics (26). Long Tail principles as applied to business markets also apply to the business of online information access by addressing how online information is marketed to the user. It explains how main stream and niche markets are linked together for users to easily locate desired information. This theory as applied to the movie, television, and music industries also supports the traditional teaching strategy of scaffolding information for easy access by learners in the classroom setting. Website learning structures can incorporate these scaffolding principles from the Long Tail Theory for use in marketing online education to consumers.

Visual design principles, as described in "Creating Graphics for Learning and Performance *Lessons in Visual Literacy*" are grounded in visual design, technology and

education theory (37). These principles support effective communication, learning, and interaction between learner and information being presented when using multimedia technology to provide education. Website training for omega-3 fatty acids experts which incorporates these basic design principles can be provided to assist them in converting printed materials into web-based content pages.

A “Learner-Centered approach to education framework” is useful when developing web-based content learning modules (15). This approach states, “Online learning compares to a ‘user-centered’ focus of modern interface design. The focus is on the needs, skills, and interests of the learner...often accompanied by a problem-based approach, where the problems are picked to fit the interests and needs of the learners.”

Domains which measure engagement, effectiveness, and viability of this website approach to online learning can be developed as suggested within the Learner-Centered approach. These domains should be developed using omega-3 fatty acids experts and based within the visual design theories, scaffolding theories, and learner-centered education approach chosen for this project. Evaluation tools will be developed which incorporate a mixed methods research design (28).

National eXtension Communities of Practice and Communities of Interest are currently operating within an established framework that provides topic specific online education (34). Evaluation systems have been developed which supply data for measuring engagement, effectiveness and viability of this topic specific approach to online consumer education (32, 33). Consent forms and research protocols for

conducting online surveys are available and can be adapted for use with this topic specific website education project (32).

Web analytic services which track website usage, access, and marketing effectiveness for work progress reports are available from registering the website with Google Analytics (31). These statistics can also be used for research purposes.

Web based research methodology is advancing. Mixed methods research designs are able to capture qualitative and quantitative data useful for answering research questions on the effectiveness of online education approaches (28). Online survey design methodology is now included with Dillman's survey design methods handbook used by the research community (29). Design issues related to the use of mixed survey modes, i.e. paper, telephone, electronic, and email, within the same study are being addressed (29). National eXtension website research provides an example of incorporating these mixed survey modes in collecting research data on website education effectiveness (32). Institutional Review Boards are including research consents within the online survey instruments used to collect research data allowing for a streamlined process of data collection (32).

Current online science-based omega-3 fatty acids and health information for consumers is available for answering consumer's omega-3 fatty acids related questions. Some examples include: Fats of Life, Medline Plus, and Office of Dietary Supplements (35, 36, and 37). Gaps, however, exist in the ability to measure engagement of consumer with the available web-based information and changes in learning resulting from this engagement. This project will provide built-in user interaction learning measures within

its website design. Research interventions using the omega-3 fatty acids website will include measurable learning objectives. Online surveys can be connected to web content pages, frequently asked questions, and ask the expert dialogue features to gather feedback from consumers who use these tools. Established online stakeholder communities will be contacted to participate in research, evaluation, and website development functions.

Online communities are becoming a well established and accepted mode of communication within the social, business, and professional communities. These communities provide a defined population useful for conducting research. It is possible, using a blended survey questionnaire approach including qualitative text questions and quantitative scale questions, to establish the learning and performance needs of each stakeholder group within the omega-3 fatty acids and health community. Data gathered from survey questionnaire can be used to develop appropriate web content to be used in web-based education interventions. This mixed methods approach can be used with dietitians to test the use of a question based educational approach for engaging dietitians with web based omega-3 fatty acids content useful in answering their omega-3 fatty acids questions (28).

Figure 1 provides an Omega-3 fatty acids Website model representing the various project components being proposed. This visual diagram shows the links between science-based information, omega-3 fatty acids experts and web-based learning resources; and between science-based information needs of consumers, primary stakeholder groups and built-in website research protocols for measuring effectiveness of website. This model is based on elements used within the National eXtension system of website design and communication (34).

Qualitative research using a phenomenology approach with stakeholder groups prior to website education intervention will help to develop the website tools to be used during intervention (30). Website relevance, need, interests, and values can be explored by utilizing open ended text based questions which are answered by stakeholders via multiple modes which include an online questionnaire, mail questionnaire, telephone interview, or in-person interview.

Quantitative research using an experimental model with pre and post measures of all selected stakeholder group participants will answer research questions related to the effectiveness of the website education intervention. Research questions to be answered include: 1) Are participants in website intervention finding satisfactory answers to their omega-3 fatty acids questions greater than 75% of the time? 2) Can participants in website intervention accurately identify the daily amount of long chain omega-3 fatty acids being recommended for their current health needs? 3) Do participants in website intervention report increased self efficacy measures in omega-3 fatty acids consumption following the website intervention?

Qualitative measures used during intervention are able to capture data related to the intervention process. This data can help identify variables which may impact intervention outcomes. Observational data will be collected from individuals administering website intervention via researcher field notes recorded during the intervention phase.

Interpretation of the research findings will be based on results from both the experimental design outcomes and the qualitative descriptions obtained. Questions

which can be answered by this approach include: 1) What stakeholder groups benefit the most from this type of website intervention? 2) What kinds of omega-3 fatty acids questions are best answered in an online educational format? and 3) How do stakeholder groups use online omega-3 fatty acids tools to answer questions and make n-3 related decisions?

Online and print versions of survey questionnaires will be developed for use in collecting website research data. A variety of questionnaires will be created and used with each phase of the website development and research process. These survey questionnaires will be designed to measure outcomes for engagement, effectiveness, and viability based on website domains and objectives as developed by omega-3 fatty acids expert community members with guidance from web development experts and current online survey methodology.

Qualitative interview protocols and collection instruments will be developed by omega-3 fatty acids expert community members to inform the development of the interactive web-based omega-3 fatty acids tools. The use of in-person, telephone, and on-line interview modes will be explored to accommodate the needs for a time efficient process of development.

An interactive food frequency questionnaire will be developed which can be completed online with results being available in a consumer friendly manner at the completion of data entry. Omega-3 fatty acids expert community members will adapt available omega-3 fatty acids food frequencies and nutrient data bases for use in an online environment.

Web based analytics can be incorporated in project evaluation reports. How these reports can be incorporated into research study design will be further explored.

Interested consumers will report that the omega-3 fatty acids website is effective in connecting them to current research findings, national experts, and useful resources which help them answer their omega-3 fatty acids questions and make omega-3 fatty acids related decisions. Interested consumers will report their daily omega-3 fatty acids intake after completing the on-line food frequency questionnaire and reviewing questionnaire results provided. Researchers will be able to measure changes in the daily omega-3 fatty acids intake of research participants when using the on-line food frequency questionnaire before and after the research intervention.

Real time communications between omega-3 fatty acids experts and interested omega-3 fatty acids consumers will be established through creation of an omega-3 fatty acids website. This website will provide online science based peer reviewed answers to basic omega-3 fatty acids questions in an interactive learning environment; and establish an effective maintenance plan for incorporating new science based information into its' website domains.

A research working group can be established among omega-3 fatty acid experts who will be responsible for developing the overall research process, protocols, instruments, and domains to be used for website development. How results will be interpreted for decision making, reporting, and determining further research needs will be informed by the mixed methods embedded design: Embedded Experimental Model research method (28).

Anticipated barriers with implementing this research project include technical training, time commitment, and financial supports. Each is reviewed below:

Limited technical training and experience of omega-3 fatty acids experts: with designing web-based educational content, using online communication tools in working committees, and conducting online research with established online stakeholder audiences.

Extensive time commitment involved during website development stages may deter needed omega-3 fatty acids experts from choosing to support this type of involvement with an interactive website. Research time commitment for participants to complete website learning intervention protocols may deter stakeholder audiences from choosing to participate in research studies.

Financial support for both omega-3 fatty acids experts and stakeholder audiences during website development and research will enhance their willingness to participate in project. Training in website design and communication will enhance participation in project. Incentive for participation will enhance participation in website education research studies.

Technical and administrative support services are needed for this project to enable working committees to stay on task and meet project deadlines. Administrative support will also enable maintenance of large communication and information databases extensively used with this interactive website endeavor.

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Table 1 Top 10 Nutrition Education Resources for Omega-3 Fatty Acids – Online (2007)**Basic Facts Online**

- Medline Plus Health Information Website
 - National Library of Medicine
 - <http://www.medlineplus.gov>
- Fats of Life – Quarterly Newsletters Online
 - Professionals: PUFA
 - Consumer: Fats of Life
 - <http://www.fatsoflife.com>

Recommendations Online

- American Heart Association Website
 - 2006 Dietary Guidelines for Heart Health
 - <http://circ.ahajournals.org/cgi/reprint/114/1/82>
- American Dietetic Association Website
 - 2007 Position Statement on Dietary Fatty Acids
 - <http://www.adajournal.org/article/PIIS000282230701490>

Research Online

- Office of Dietary Supplements Website
 - Omega-3 Fatty Acids & Health Research Summary Reports – 2005
 - <http://ods.od.nih.gov/>
- American Journal of Clinical Nutrition Online
 - 2006 Summary of a workshop on n-3 fatty acids: current status of recommendations & future directions
 - <http://www.ajcn.org/cgi/content/abstract/83/6/S1483>

Education Online

- Cornell Nutrition Works Online Continuing Education for Dietitians Website
 - Omega-3 Cyber Seminar Presentation
 - <http://www.nutritionworks.cornell.edu>
- University of Massachusetts Amherst Online Nutrition Courses Website
 - Omega-3 Website & Cyber Seminar
 - <http://www.umassone.net>

Food Sources Online

- USDA Nutrient Database Online
 - Provides omega-3 fatty acids nutrient values in common foods
 - <http://www.nal.usda.gov/fnic/foodcomp/search/>
- KIM (Keep it Managed) Database Online
 - Provides omega-3 fatty acids and omega-6 values for over 9,000 foods
 - <http://efaeducation.nih.gov/sig/kim1.html>

Notes:

Research Question: “What is the role of Omega-3 fatty acids in relationship to human health?”

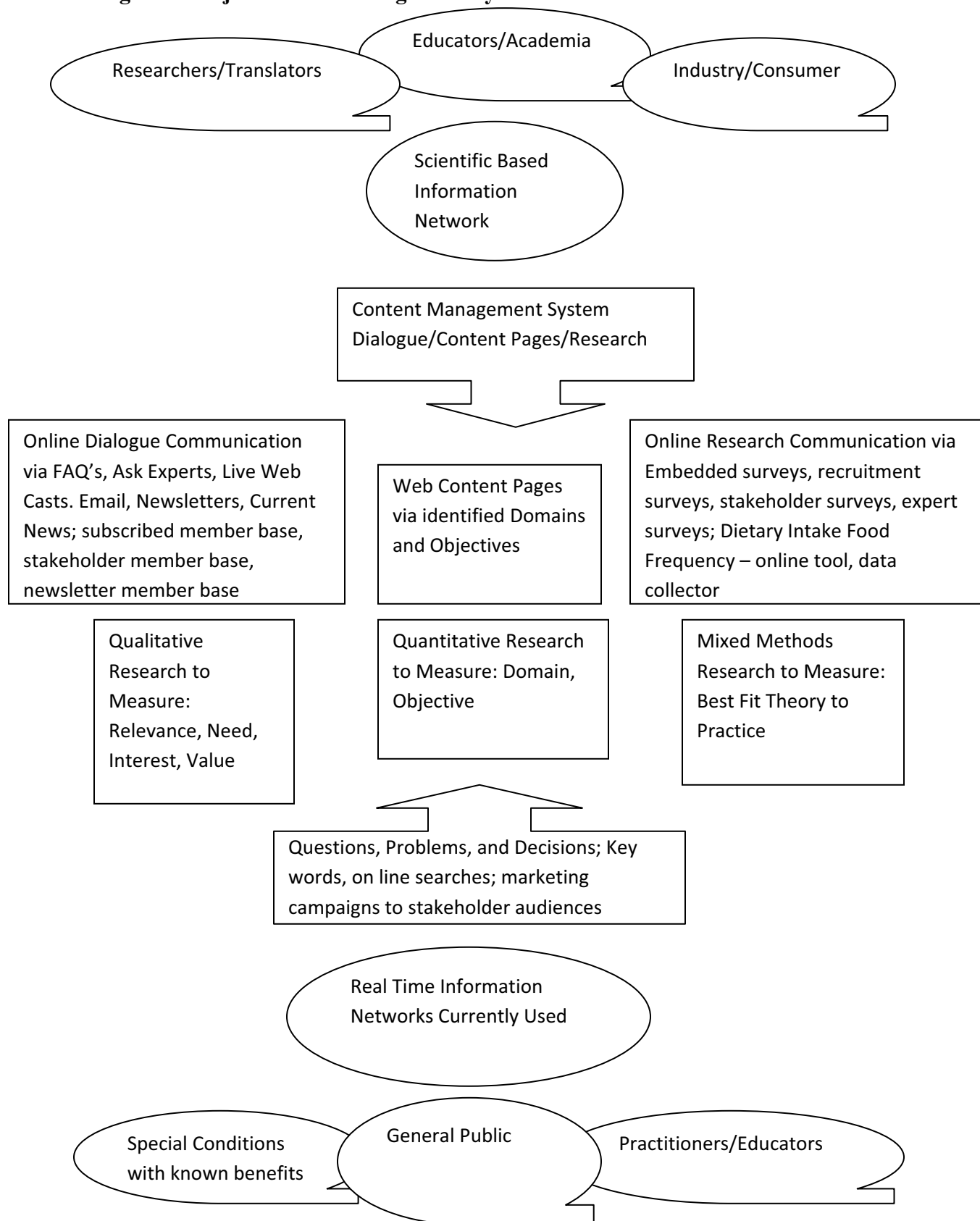
Message Context: “Omega-3 fatty acids are a healthy fat with benefits for everyone.”

Table 2 Omega-3 Fatty Acids Websites (2005)

Government Associations	Audience	Content/Cost	Release Dates
Office of Dietary Supplements, National Institutes of Health Website http://www.ods.od.nih.gov	Health Professional and Public	“Omega-3 Fatty Acids and Health” – Summary of key findings AHRQ Reports – Free website access	Document last updated 10/28/2005; site accessed 7/19/2006
Agency for Healthcare Research and Quality Clinical Information, Evidenced-based Practice www.ahrq.gov/clinic/index.html	Health Professional and Public	Omega-3 Fatty Acids Reports; eleven reports – Free website access	release dates ranging from March 2004-August 2005; site accessed 8/21/2006
Professional Associations	Audience	Content/Cost	Release Dates
American Dietetic Association (ADA) Evidence Analysis Library; ADA Nutrition Care Manual www.adaevidencelibrary.com ; www.eatright.org	Health Professional and Clinicians	Disorders of Lipid Metabolism Nutrition Practice Guideline; Disorders of Lipid Metabolism Toolkit; Patient Care Handouts – Membership login required; \$20.00 for Toolkit; subscription fee for Nutrition Care Manual	Guidelines posted August 2005; Toolkit posted July 2006; site accessed 8/17/2006.
University/Extension	Audience	Content/Cost	Release Dates
Kansas State University, Department of Human Nutrition Omega-3 Fats Website http://www.oznet.ksu.edu/humannutrition/omega3.htm	Health Professional and Public	Website helps increase knowledge and awareness about omega-3 fatty acids and provides ideas for increasing omega-3 intake and safe use of supplements – Free website access	Website created 2001, updates coming stated; site accessed 10/11/2005 and 7/19/2006, no changes during visits
Nutrition Professional Continuing Education	Audience	Content/Cost	Release Dates
UMass Online Nutrition Education, University of Massachusetts Amherst, Online Courses and Cyber seminars http://www.umassone.net	Registered Dietitians	Online Seminars and Workshops for Health Professionals: Omega 3 Fatty Acids: Remedies, Risks and Recommendations – Membership login required; free membership sign-up	Cyber seminar posted in fall 2005; site accessed 7/19/2006
Cornell Nutrition Works, Online Continuing	Registered	Online Continuing Education: Health	Cyber-Presentation

Education, Cornell University, Division of Nutritional Sciences Online Continuing Education http://www.nutritionworks.cornell.edu	Dietitians	Benefits of Long Chain Omega-3 Fatty Acids: From (Before) the Cradle (Nearly) to the Grave – Membership login required; free membership sign-up	posted in spring 2006; site accessed 7/19/2006
Medical Professional Continuing Education	Audience	Content/Cost	Release Dates
Medscape Medical News, Online Continuing Education (CME/CE) for Healthcare Providers www.medscape.com/viewarticle/536831	Healthcare Clinicians	Online Continuing Education (CME/CE): AHA Dietary and Lifestyle Recommendations Revised – Membership login required; free membership sign-up	Release Date: 6/19/2006; site accessed 6/28/2006
Bismarck Center for Medical Education, Online Continuing Pharmacy Education; Princeton Media Associates www.princetoncme.com	Healthcare Clinicians	Online Continuing Pharmacy Education: Omega-3 Fatty Acids in the Management of Hypertriglyceridemia: New Findings and Formulations – Membership log-in required; free membership sign-up	Release Date: 10/28/2005; site accessed 7/17/2006

Figure 1 Project Model: Omega-3 Fatty Acids Website



MANUSCRIPT I:

Dietitian's Experiences with Computers, Education and Omega-3 fatty acids in the
Workplace: A Qualitative Phenomenology

ABSTRACT

The purpose of this study was to provide an in-depth account of the computer uses, educational preferences, and omega-3 fatty acids interests from a representative group of urban and rural dietitians from the Midwestern United States. Data for this in-depth, qualitative study were collected using on-site semi structured interviews. Ten registered dietitians, from a State Dietetic Association Membership Map were recruited using systematic, non-probabilistic sampling. The Phenomenon of Interest is, “How dietitians use online information in the workplace, what they consider effective online communications and knowing what influences their decision making behaviors around omega-3 fatty acids.” Interview transcripts were analyzed using a phenomenological approach. Key themes show computers are well integrated in dietitian work settings. Online learning is pursued with topics of interest and familiarity. Omega-3 fatty acids education is driven primarily by audience demand. Education allowing for people connection and communication through familiar and trusted channels is preferred. Valued online features include information that is easy to access, scan, save, print, and send. Study results highlight the need for reformatting online nutrition information to accommodate common search methods used by dietitians in a time limited; question oriented, and needs based work environment.

INTRODUCTION

We live in an age of rapidly advancing technology which influences how workplaces conduct business. Abundant information often carries expectations in the health care arena to incorporate information in daily decision making processes with clients. How to use technology advances to effectively locate, process, and incorporate information into evidence-based care decisions however, is not always clear.

“How dietitians use online information in the workplace, what they consider effective online communications and knowing what influences their decision making behaviors around omega-3 fatty acids” is explored in this qualitative research study. Qualitative phenomenology methods are used which are best suited for answering “how” and “what” type research questions (1).

Consideration to the processes by which data becomes information, information becomes knowledge, knowledge becomes education, and education influences professional practice within the online environment is needed. This study uses the higher education “Learning Paradigm” approach discussed by Barr (2) where “producing learning” becomes the purpose of education. Barr states the means for achieving “student learning” becomes “using approaches best suited to prompting learning of particular knowledge by particular students.” Criteria for success are based on student learning outcomes and student success outcomes. This approach used with dietitians as the learners allows them to be part of the defining process for what works best to meet

their learning and performance needs about omega-3 fatty acids within their work environment via computer technology.

Research supporting the many and varied health benefits of dietary omega-3 fatty acids continues to grow. Research findings show omega-3 fatty acids benefit prevention and treatment of heart disease, visual and brain development in infants, contributions toward basic health, along with a positive impact in treatment of several health conditions involving the immune system, cognitive functions and mental health (3-7).

Current omega-3 fatty acid dietary intakes for Americans are reported at 0.5 grams/day (8). This is half the adequate intake levels of omega-3 fatty acids for adults recommended by the Food and Nutrition Board – Institute of Medicine 2002/2005 (9). The American Heart Association recommends 1.0 grams/day omega-3 fatty acids from diet including both marine and plant sources for heart health (10). Published research suggests dietary intakes of fish are low in Midwestern populations (11). Dietitians well informed of omega-3 fatty acids role in maintaining health can support increased dietary intakes of omega-3 fatty acids among audiences they serve.

Qualitative research methods have been used with other healthcare professional groups to identify their online information needs for evidence based decision making (12, 13). One study of dietitians and technology (n=156) reports 66% have access to the internet at work, and 39% use the internet once a week or more primarily for searching for health information, research, and communication (14).

Bringing nutrition education to the dietitian work place where most evidenced-based care decisions are made makes sense (15). Online health information which is current, relevant, and accessible is now possible from one's worksite desktop with technology advances providing for standardization of browsers, search engines, and online journal newsletter subscriptions. One survey of dietitians (N=190) supports using computer technology methods with dietitians to provide omega-3 fatty acids nutrition education (NC-1167 Multi state Research Project Nutrition Education Team Survey, unpublished data, 2005).

Research on how dietitians currently use computers in the work place setting for education and information tasks is limited. The purpose of this project is to explore how to capture the interests of busy professionals and provide them with omega-3 fatty acids information which will meet their work place needs.

METHODS

Participant Recruitment

Emails were sent to dietitians listed on the State Dietetic Association (SDA) member website, inviting them to take part in formative research with dietitians (16). The SDA website is known among dietitians in the state for reliable information and useful communications. Dietitians were told that researchers wanted to identify current continuing education practices of dietitians, to identify current dietitian practices in

relation to omega-3 fatty acids intervention with clients and to obtain feedback on several omega-3 fatty acids education and assessment tools. Approval to perform the study was obtained from the Institutional Review Board at the University.

From 419 names listed on SDA website, 251 names met study criteria which included, being a registered dietitian (RD), licensed medical nutrition therapist (LMNT), and having a listed email address. Names meeting criteria were further sorted into state districts (N=5). Every 5th and 10th name was selected from each district (N=43). The overall goal was to conduct 2-3 interviews from each district.

Thirty-one responses to email invitations were received (68%). Dillman's mail and internet surveys recruitment procedures were followed consisting of 3 email follow-ups sent to non-responders along with a 4th telephone contact attempt when phone number was available (17). From those who responded, 11 agreed to be interviewed, 3 did not meet eligibility criteria, and 17 declined participation. Of those who declined participation, 11 were willing to provide demographic information and their reasons for declining. Eleven interviews were subsequently scheduled by email and telephone, with one participant declining prior to interview. Additionally, demographic information was collected from ten respondents declining participation in interviews.

Conducting Interviews

Two researchers conducted all interviews; one leading interview questioning and the second recording detailed responses in research journal for later transcription. Interviews were arranged with dietitians with convenient location and time selected by each

dietitian. Locations varied from restaurants near dietitian work setting to within work setting environment, with one interview being conducted long distance using speaker phone and fax machine communications. Each interview lasted 45 minutes to 1 hour and 15 minutes. The interviews took place in April and May 2006.

Data were collected using basic qualitative research processes as reviewed in Monsen (20) and Creswell (1). The semi-structured interview procedure involved construction of an interview protocol outlining areas of interest to be discussed during the interview. The interview protocol served as an interview guide only. During the interview, questions were adapted to the specific context, and interesting issues of participants that arose were probed further.

Following questions to obtain demographic information, five broad subject areas were explored: 1) computer usage for professional education and patient education – important elements, 2) access to available web resources (i.e. research, education, tools) – important elements, 3) general professional learning practices and patient intervention practices with omega-3 fatty acids – “What does current practice look like?”, 4) resources for measuring dietary omega-3 fatty acids intakes – review samples and provide comments and ideas, and 5) resources for omega-3 fatty acid education – review samples and provide comments and ideas.

The interviewer introduced each area with an open-ended question. The participant responded at length with encouragement and probing questions from the interviewer. Visual graphics such as printed samples of website home pages and nutrition education materials were used during interview as examples to facilitate

participant recall of preferences, interests, experiences, and needs in terms of computer design components, measurement tools, and educational tools.

Data Analysis

Data analysis protocols were developed based on qualitative phenomenology principles described in Creswell (1). All research team members participated in the data analysis process.

A qualitative phenomenology data analysis approach includes: a) getting a feel for the data, b) extracting significant statements, c) researcher describes meaning of the experience related to them, d) formulate meanings of significant statements, e) cluster meaning statements into meaning units (common themes), f) meaning units (common themes) validated with original informant interview descriptions, g) write “exhaustive description” or “essence” of informants’ experience with learning, computers, and omega-3 fatty acids.

Analysis procedures

1. Handwritten interview notes (over 180 pages) typed in transcript form were studied by two research team members to obtain an overview of the participant’s responses. All transcripts were coded by identifying numbers to protect informant interview identities. Notes were made (in the margins of the transcripts) to form initial codes (a word or a short phrase). These codes were discussed at length between

researchers until a consensus was achieved and an unduplicated cumulative list of codes was created from across all interviews.

Significant statements supporting identified codes were subsequently extracted from transcripts independently by researchers providing an exhaustive list of unduplicated significant statements (phrases, sentences related to learning, computers, and) related to these initial codes. These statements were discussed at length until a consensus was achieved and a combined list of non repetitive significant statements was created across all interviews.

2. One researcher (M.V.) proceeded to formulate meanings for each significant statement and cluster meanings into common theme units emerging from data. Meanings (themes) and meaning clusters (higher themes) were checked against original interview transcripts independently by two researchers (M.V. and P.R.-G.) for completeness and accurate representation of interview data. Following further discussions, a list of shared themes was agreed upon and supported by significant statements gathered from the participants.

3. In describing the essence of the participant experience with learning, computers, and omega-3 fatty acids, 12 key messages were identified and three key terms emerged threading through the data. These were validated through in-depth discussion and consensus among researchers (M.V. and P.R.G.) and participant email invitations to review and comment on key messages, term definitions, and exhaustive list of unduplicated significant statements revealed from data analysis.

In addition to discussions between main research team members, a third research team member independently reviewed data analysis documents at each step and provided feedback to further define and validate the findings. This technique is called triangulation and is used within qualitative research to establish validity. The aim of validity is to verify that the analysis has been performed in a systematic manner and findings are supported by the data.

To facilitate exploration of the researcher's personal experience with phenomenon, online interviews were conducted with two of the research team members using participant interview protocol questions as an interview guide. These interviews were completed and returned via email to one researcher (M.V.) prior to beginning data analysis. Data were analyzed separately by researcher and used for defining and validation of participant findings. Researcher notes, memos, and writings during the qualitative process were also chronicled and used during the formulation of meanings and "essence" of informants experience.

Reporting process in phenomenology

Phenomenological research involves a narrative presentation of the "essence" of the experience with tables and figures of meaning units and significant statements to support the narration (1). This presentation includes how phenomenon is viewed in the literature, how the researcher experiences it and an overall description of the main themes of participants' experiences with phenomenon and how they're related to one another.

This study reports "how" phenomenon was experienced through identifying key terms and their definitions being used during interviews between researchers and

participants. “What” participants experienced is provided through the development of twelve “overarching themes” emerging from participant’s non repetitive list of significant statements. Context is provided through textual description of common time preference participants assigned to online work related tasks.

RESULTS

Demographics

Ten dietitians, all women, signed a consent form and were interviewed. Demographic information for those interviewed (n=10) is provided in Table 1. Demographics of those declining to participate (n=11) are provided in Table 2. Interview sample demographics are representative of the larger dietitian population as reported in the 2005 American Dietetic Association Salary Survey (18) and the 2007 Society of Nutrition Education Journal Readership Survey (19). All those interviewed have been practicing dietetics for 20 years or more. Their audiences served represent the population groups typically served in the Midwest. Dietitians willing to be interviewed and those declining participation both provide insight on the information needs, computer uses, and potential omega-3 fatty acids interest of dietitians in the Midwest area.

Defining Terminology

Clarifying definitions for “education,” “information,” and “communication” became necessary early on in conducting interviews. Gathering meanings for these words became part of the interview process. Figure 1 depicts how these terms are defined, experienced and related to each another in relationship to the online environment experienced by interview participants. Features stated include those elements emerging from the data which dietitians considered most relevant to them.

Overarching Themes

Data analysis revealed thirty five significant statements, from these statements, twelve overarching themes were identified which describe the “Online Learning and Performance Needs of Dietitians in their Work Environments”. Headings and subheadings used in reporting themes include common language terms emerging during interviews which provided a framework for conversation between dietitian and researcher.

Major headings include computers, education, websites and omega-3 fatty acids. Each heading signifies a distinct relationship expressed through preferences, uses, or interest. Subheadings highlight more specific elements impacting the relationship within a particular theme area.

Overarching Themes Emerging from Significant Statements are as follows:

Computers

- Computers are integrated into the daily work functions of dietitians.

- Dietitians are comfortable with using computers in their daily routine.

Education

- **Professional education** is enjoyed most when opportunities to dialogue with other participants and presenters is made available.
- **Client nutrition education** relies heavily on flexible tools for delivering and reinforcing messages.

Websites

Uses

- Websites are being used by informants to make connections, to gather information, and to reinforce learning.
- Websites function in a supportive role with communicating, information seeking, and learning.

Access

- Primary access to websites by informants is through familiar and trusted communication channels.
- New information is generally received through these familiar and trusted communication channels.

Education

- Effective website education takes into consideration: limited time available for learning, visual aids allowing for quick scan, ability to save, print, or send information for future access, and traceable references, contacts, and source of information for follow-up.

- Effective website education involves coordinated messages with current and familiar educational systems used by informants including onsite, online, and printed venues.

Omega-3 fatty acids

Education

- Omega-3 fatty acids Nutrition Education is audience driven.

Messages

- Audience Driven Omega-3 fatty acids Nutrition Education messages must address:
 1. **Audience specific benefits** – for normal growth and development; for prevention of condition or disease; for medical treatment of condition or disease
 2. **Audience appropriate intake recommendations** – how much is enough; dietary sources versus supplement sources; measuring current dietary intake adequacy
 3. **Cultural context surrounding dietary fat intake** – addressing the beneficial role of dietary fats in overall health

Online Time Preferences

When asked about computer time preferences for completing work related tasks, common online time frames identified include:

Quick Search – 15 min (range 5 min – 30 min)

Patient Question – 5-10 min (client present); 10-15 min (materials mailed)

Media Questions – 15-20 minutes

Class preparation; topic research; literature reviews – 1-2 hrs (average)

Daily list serve review – 20 minutes

Daily updates (email/links) – approximately one hour

“I will take the time that’s needed; however, I prefer less time”

Reasons Provided for Not Participating in Research Interviews

Reason for Not Participating	Number of Registered Dietitians (N=11)
Not interested in omega-3 fatty acids	2
Currently not counseling clients	6
Limited time available	5

Quotes from Participants Declining Participation in Research Interviews

“I am a full time instructor...and new mom. I just don’t have the time right now basically.”

“I work for the WIC program in rural Nebraska. We are trying to educate moms to provide the basic nutritional requirements...the questions about types of fats seldom come up.”

“I wouldn’t want to waste the interviewer’s time with answers like ‘I don’t know’.”

“Omega-3 fatty acids are not of interest to me.”

DISCUSSION

Online information needs of dietitians are comparable to those of other health professionals (12, 13). This includes the need for access to topic specific information useful in the decision making process from trusted and reliable channels which are easy to navigate with information formatted in time sensitive packaging. The information needs of dietitians for omega-3 fatty acids included: online access to omega-3 fatty acids information sources which are kept current, user friendly, linked to other information sources and field experts, and formatted to dietitian search methods (the benefits according to audience, frequently asked questions, and basic facts).

Marketing quality online nutrition information and education through familiar and trusted communication channels will increase access and use. Each communication channel however requires its own marketing approach. Onsite, printed and online channels are all currently used by dietitians for learning. These are often connected with registered dietitians, government agencies and universities.

These study results suggest when dietitians are seeking online information there is familiarity with topic, usually a specific question in mind, and searches frequently begin with familiar sites. Using education methods and strategies which address these factors will increase learning. This would include formatting omega-3 fatty acids education through frequently asked questions, providing topic updates with access to basic background reviews through linking. Using dietitians in marketing, educating, and dialogue about omega-3 fatty acids topics with other dietitians will provide trust essential for effective learning to occur. Using linkages to other websites providing quality information is also most effective as dietitians want a common starting place and are then willing to explore further to have their questions answered.

The request for basic facts about omega-3 fatty acids which facilitates nutrition education and the dietary decision making process presents a challenge in the online environment. Audience specific language, context, and interest level are vital components in facilitation of education and decision making. Having the opportunity to dialogue with information users in order to create useful information is important.

At what point in online communication does information become education? According to study participants this occurs when information is made relevant to the learner. Relevance defined by the dietitian as a learner is multifaceted, involving interest in the topic, “need to know” urgency; the ability to locate information which will answer their questions in a timely fashion. In an online environment, attention to learner’s prior knowledge of the topic (novice versus expert) will impact key search words and categories used to locate information. Experts develop categories for storing information which enable more effective searches for relevant information useful in learning.

Novices however, need assistance in establishing categories for storing relevant information linked to their current baseline knowledge of the topic for effective searches that provide useful information for learning.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Effective online education makes information relevant to the learner allowing for learner centered objectives and success criteria to be met. Success thus depends on the initial goals of the learner. How learning is measured thus becomes more focused on the process of learning with online tools. Process criteria will need to be developed which is specific to the learning audience. This study identifies several key elements with dietitians which can be used for creating online learning tools based on dietitian learner centered objectives.

Effective omega-3 fatty acids education includes tools which facilitate dialogue and understanding of dietitian and audience learning needs and whether or not these needs are met through the online education formats selected. This study highlights several key omega-3 fatty acids interests of dietitians useful for creating a learning guide which would include a feedback mechanism for adjusting information to better meet learning audience needs. A learning guide must be able to measure if learning is occurring. Evidence-based decision making, where science based findings are incorporated into practical guides for daily living, is part of this educational process. Key

findings from this study can be used to develop a quantitative measurement tool to assist in measuring omega-3 fatty acids website quality for dietitian audiences.

Qualitative findings support the need for professional website designers to be included in making information available to dietitians in a quick scan manner with navigation tools that provide easily finding information and moving through site and links. Also noted is the wide variance in interests displayed by dietitians which most probably links to the wide variance in the audiences which they serve in their work settings. Making a site viable to this large audience requires continued efforts to be very clear about who the intended audience is, and the relevance and priority attached to each category of information contained within the website tool.

Providing communication through familiar, credible, and reliable channels used by dietitians includes asking the question, “What marketing strategies should be considered to make website available to dietitians based on how dietitians access online information?” Further research is needed to answer this question.

Easy scanning of information often requires that information be chunked, linked and connected in a ‘non-book’ ‘non-linear’ fashion. Research articles are written in a linear fashion. Education modules are written in a linear fashion. Further research is needed on how to reformat common professional writing styles to accommodate online reading practices of professionals including chunking, connecting through keywords, outlines and road maps required for research information to be accessed through search engines using “frequently asked question” format.

Dietitians are key players in producing dietary lifestyle changes which will enhance the health of their clients. Current healthcare arenas provide limited time for professional and client contact. Time is also limited for preparation and documentation of interventions and outcomes. Client demand often drives how client contact time with the dietitian is spent. If we are to succeed in producing evidence-based results from omega-3 fatty acids dietary interventions we need to provide professionals with time effective access to current information, tools, and resources which work within their available time frame. Providing electronic data collection tools and printable forms will allow professionals to collect data on all their clients and position them as evidence-based practice providers who can show the benefits of omega-3 fatty acids diet interventions with their clients.

Development of an omega-3 fatty acids website where dietitians could access information for clients, themselves and applied to practice guidelines will meet current professional needs according to research findings. Marketing this web site through American Dietetic Association State Affiliate Websites and Dietetic Practice Group Email list serves will support dietitians' need for "reliable" source access through current worksite computer communication systems. Findings from this qualitative research study applied to the development of an omega-3 fatty acids professional website can be tested by dietitians to validate its effectiveness in meeting the learning and performance needs of dietitians as a tool in facilitating incorporation of evidence based practice omega-3 fatty acids nutrition interventions in the work setting.

ACKNOWLEDGEMENTS

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Table 1 Personal Demographics of Registered Dietitians Participating in Qualitative Research (N = 10)

Current Work Setting - Locations¹	Number of Registered Dietitian Working within Setting
Hospital	
Acute care/inpatient	5
Ambulatory care/outpatient	5
Long Term Care	3
Community/Public Health	
Elderly	3
Other	4
Consultation/Contract Services	
Individual/Group	3
Education and Research	2
Food and Nutrition Management	3
Current Work Setting - Population Estimates	Number of Registered Dietitians Working in Population Setting
Less than 10,000	4
10,000 up to 50,000	3
50,000 up to 100,000	1
100,000 up to 500,000	3

Years Practicing in Dietetics – 20 years and greater All Ten Registered Dietitians

Education Degrees - Received Number of Registered Dietitians

Bachelors	3
Masters	5
Doctorate	1
Other ²	6

¹Participants chose multiple work settings for their current employment

²Other degrees reported: Distinguished Health Care Administrator (HCA), Master in Health Services Administration, Master in Public Health Administration, Certified Diabetes Educator (CDE), Licensed Dietitian (LD), Registered Nurse (RN)

Table 2 Personal Demographics of Registered Dietitians Declining Participation in Qualitative Research (N = 11)

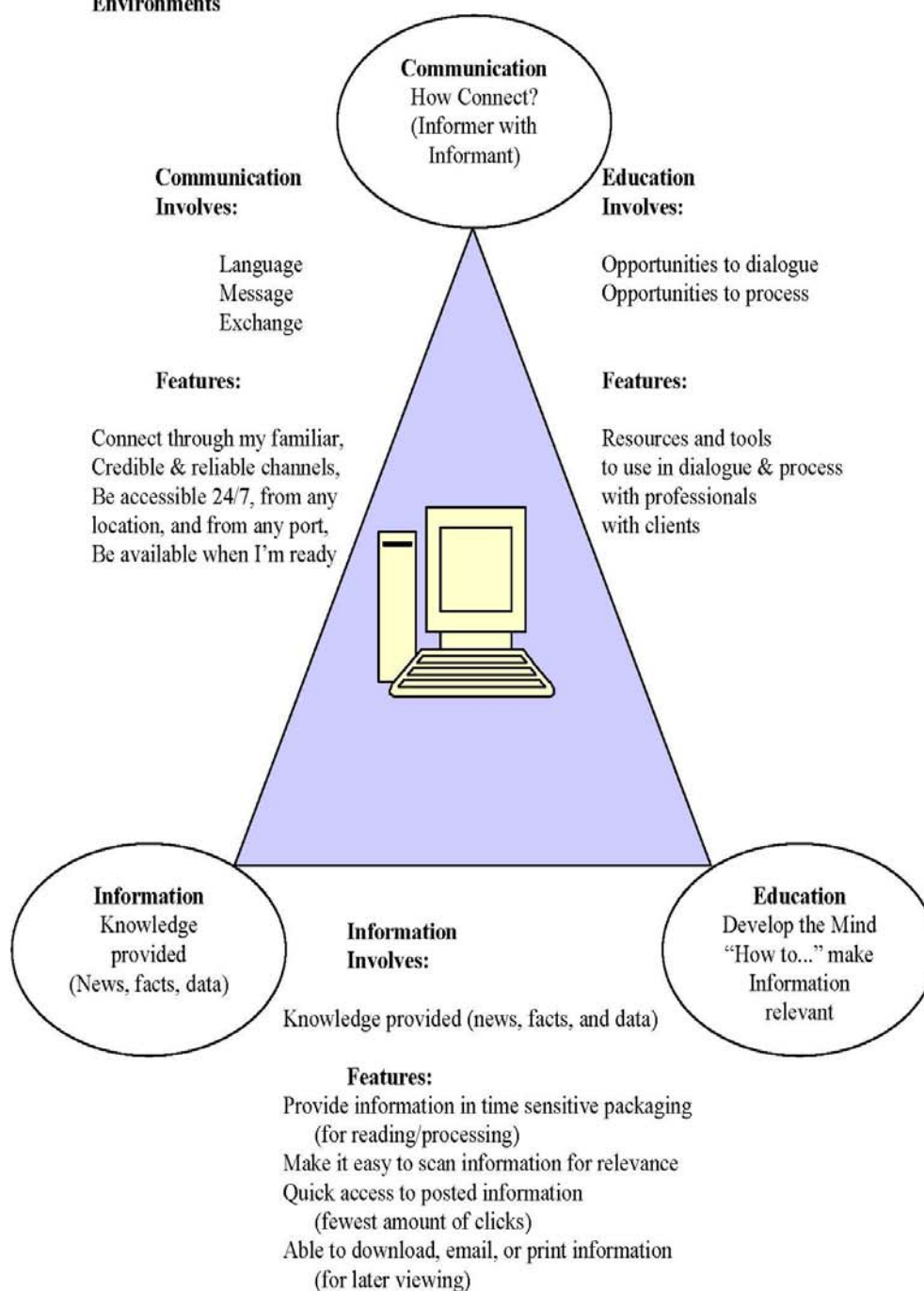
Current Work Setting - Locations¹	Number of Registered Dietitian Working within Setting
Hospital	
Acute care/inpatient	3
Ambulatory care/outpatient	1
Long Term Care	2
Community/Public Health	1
Women, Infants, and Children	1
Elderly	1
Other	1
Consultation/Contract Services	
Individual/Group	2
Business	1
Education and Research	2
Food and Nutrition Management	none
 Current Work Setting - Population Estimates	 Number of Registered Dietitians Working in Population Setting
Less than 10,000	3
10,000 up to 50,000	3
50,000 up to 100,000	none
100,000 up to 500,000	6

Years Practicing in Dietetics	Number of Registered Dietitians²
Less than 5 years	1
5 to 9 years	1
10 to 19 years	2
20 years or greater	6

¹Participants chose multiple work settings for their current employment

²One individual did not provide number of years in practice

Figure 1 Definitions of Key Terminology Dietitians Use When Discussing Online Environments



MANUSCRIPT II:

Omega-3 Website for Dietitians: ADA State Affiliate Member Survey Results and
Future Steps

**Abstract to be published in Journal of American Dietetic Association (JADA)
September 2009. Poster presentation to be given October 19, 2009 in Denver,
Colorado at Food and Nutrition Exposition and Conference (FNCE)**

Title: Learnomega3rd: A Website Design Streamlining Access to Online Resources
Useful for Answering Dietitian's Omega-3 Questions

Introduction

In 2005, a survey of registered dietitians was conducted to assess their current knowledge, practice and interest in omega-3 fatty acids and health within the work setting by the Omega-3 Multi-state Research Committee (1). As part of this effort, an omega-3 website for dietitians was designed to provide online access to information and resources regarding “omega-3 fatty acids and health.” To test the effectiveness of a website approach in providing education, ADA state affiliate members within one state were invited via an email list serve to visit omega-3 website for dietitians and complete an online research survey. They were asked to list their omega-3 questions and to assess usefulness of website in answering their questions. This article summarizes the survey methodology, survey findings, and implications for future use of website technology in providing streamlined access to online information useful in answering dietitians’ omega-3 questions. It also serves as an example of emerging professional research in establishing key search terminology and key questions used by dietitians in an online environment, which should be of interest to all involved in providing omega-3 nutrition education. This project is part of a mixed methods research study addressing the role of website technology in meeting online omega-3 learning and performance needs of dietitians in the work place.

In order to assess the effectiveness of website technology in meeting dietitian online learning and performance needs, a qualitative research study was conducted which identified these needs (2). Key themes identified and used in Learnomega3rd website content development and design include: a question-based learning approach,

adaptability of educational materials for multiple audiences, and multimedia applications allowing for links to omega-3 websites, resources, and current published research articles.

This survey supports findings from the ADA Nutrition Informatics Member Survey as reported in November 2008 looking at the types of technology applications used by ADA members for planning and educational purposes (3). In their report, the Nutrition Informatics Work Group proposed the following working definition of the term *nutrition informatics*. “Nutrition Informatics – [is] the effective retrieval, organization, storage, and optimum use of information, data, and knowledge for food and nutrition-related problem solving and decision making. Informatics is supported by the use of information standards, information processes, and information technology.”

About the Survey

Survey questions were selected by the researcher based on qualitative research findings identifying dietitian online time preferences for work related tasks, interest in omega-3 topic, use of omega-3 information in the work setting, and comfort level with website technology applications for learning. Standard ADA demographic questions used in previous ADA Membership Survey (4) as well as questions from website survey templates provided by Survey Monkey services (5). The survey was 20 questions and administered online through Survey Monkey (www.surveymonkey.com). A \$20.00 gift card from a selection of local stores provided a survey completion incentive for each participant available upon completion of research participation.

A pilot version of the survey was tested by a group of 9 dietitians, university faculty, and graduate students during July-August 2008 with subsequent modifications

for improved understanding, question clarity, and online survey access. An e-mail with a link to the Learnomega3rd website which contained a survey link was sent to state affiliate ADA e-mail list serve participants on August 20, 2008. Subsequent e-mail reminders including a direct link to both survey and website were sent on August 26, 29, and September 3, with survey link being terminated on September 6th, 2008.

General Survey Statistics

A total of 520 e-mails were sent to state affiliate ADA members (by means of a newly created state affiliate list serve). There were 281 unique website visitors, a response rate of 54%. Of website visitors, 109 attempted completion of survey with a total of 55 usable survey responses, a response rate of 19.6%. Members contacted through list serve spanned all classes including active (registered dietitians), retired, student, and technician (dietetic technician, registered) categories.

Demographics

Table 1 shows the personal demographics of dietitians participating in this website research survey. One participant chose not to provide demographics. An electronic informed consent research project description was provided for question one of survey form. This survey is part of a larger research study, which has been approved by the University of Nebraska Institutional Review Board. Survey demographics are

comparable with other dietitian surveys conducted by the American Dietetic Association in previous years (5, 6, and 7).

Professional focus in current work settings is reported as follows: RD (89.1%); LMNT (63.6%); Nutrition education - 1 on 1 or group (60%); Counseling - 1 on 1 or group (45.5%); Student (7.3%). Respondents report serving multiple audiences in their work setting as well with primary audiences served listed in descending order: general adults (73%), elderly (67%), diabetes (53%), weight management (53%), cardiac (45%), children 2-11 (35%), and youth (31%).

Types of Omega-3 Questions

Table 2 provides a list of omega-3 fatty acids questions submitted by respondents ranked in order of frequency within identified category themes. Dietitians were asked to list their omega-3 fatty acids questions in survey text boxes. These text responses were further analyzed using content analysis methods, chosen for their ability to help define boundaries, limitations, and uses of information within an environment (9).

Major themes: known benefits (42%), best sources (31%), recommendations (23%) and limited interest (5%). Percentage of questions relating to theme reported.

Sub themes: known benefits: general health, (14%), special conditions (14%), controversies/relationships (13%); best sources: general (6%), foods (14%),

supplements (6%), menus/recipes (5%); recommendations: general health (13%), special conditions (6%), and safety (5%).

Frequently asked questions: a total of forty nine frequently asked questions were identified, each question requested within a range of 2 to 14 times, see Table 2 for questions ranked in order of frequency within category themes.

Question complexity: 70% of the 142 questions submitted contained at least three key concepts which could be utilized for locating online information sources useful in answering the question.

Information Uses

The majority of respondents report using website information for: staying current (82%), medical nutrition therapy counseling (62%), individual education (62%), and group education.

Finding Answers

Fifty-one percent of respondents found answers to their omega-3 questions in less than 30 minutes, 47% were able to find answers within 30 minutes to 1 hour. Fifty-three percent of respondents found answers to some of their questions while using website information sources. Forty-five percent were able to find answers to all their omega-3 fatty acids questions.

Satisfaction with the time it took to locate answers is reported as “satisfactory” by 58% of respondents, “somewhat satisfactory” by 35%, and “not satisfied” by the remaining 7%. Further data analysis of respondent feedback suggests that being able to access information sources quickly which provide answers to all of one’s questions is valued by respondents.

Website Ratings

Respondents rated omega-3 fatty acids website tool as meeting or exceeding their expectations in being professional and informative. A desire for additional visual aids was requested to enhance websites visual appeal. In regards to omega-3 fatty acids content provided by this website tool, respondents rated information as meeting or exceeding their expectations in being relevant, useful, and credible. Respondents report a high likelihood of future website visits: scale of 1 to 4 (unlikely, likely) participants’ rating 3.51.

Website Feedback

Four primary themes were identified in text feedback provided by respondents: 1) please adjust presentation of information to increase usefulness – 30%; 2) affirming usefulness of website information to me as a dietitian in my work – 25%; 3) please help me find or access information for answering my questions – 17%; and 4) additional kinds of information I would like added to enhance website usefulness – 17%. These responses

are reflective of the wide variation of work settings, audiences, and levels of experience existing within dietitians responding to survey.

KEY FINDINGS

This is the first omega-3 website survey to collect dietitians' current omega-3 questions, and their use of online omega-3 information for answering those questions. This research also looks at effectiveness of an online survey to collect feedback on effective ways to package online information for streamlined access and use in the workplace for dietitians. This omega-3 website tool met and exceeded respondent expectations in five out of six areas: informative, relevant, useful, credible, and professional. Respondents report a high likelihood of return visits to website given professional access as evidenced by an overall rating of 3.51 on scale of 1 to 4. How online information is packaged represented the largest percentage of respondent feedback. Website access links using simple navigational texts guides with visual variety in colors, fonts, and text size were used within Google Sites web development framework. Web design was fashioned in an online library formatting style with headings, files, folders, and link descriptions. Respondents were able to use format effectively to find and access online information, however, the use of photographs, diagrams, and topic summaries directly within webpage frame is desired along with direct linkage to credible information source.

- Major areas of interest for dietitians regarding omega-3 identified include: Known Benefits, Best Sources, and Recommendations. Within these major interests, 49

key questions and a secondary level of categories were formulated providing an online roadmap useful in streamlining quicker access to relevant information.

- Dietitians are using online information for professional and client education with top respondent uses for online omega-3 information reported as: staying current (82%), medical nutrition therapy counseling (62%), individual education (62%), and group education (51%).
- Learnomega3rd Website is an effective tool for answering dietitian's omega-3 and health questions as evidenced by the majority of respondents finding answers to their questions with ease in a satisfactory time frame.

FUTURE STEPS

Major themes, sub themes, and frequently asked questions identified from this survey will be used to create an online language for effectively communicating omega-3 and health nutrition information with dietitians and consumers in an online environment. This is goal of the eXtension Initiative which seeks to create topic specific interactive online education for the public and professional connecting national experts and public interest in an online community (6). This also supports the need of dietitians for incorporating evidenced based practices within their work setting (7).

FUTURE DIRECTIONS

The use of this omega-3 fatty acids website tool which includes a built in evidenced based practice format for answering questions is worth further exploration. Literature reports that dietitians are using evidenced based guidelines that are available and would implement more evidenced based care practices in their work setting if they were made available as developed guidelines for care (5, 7, and 11).

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Table 1 Personal Demographics Registered Dietitians Participating in Website Research Survey (N = 54)

Current Work Setting - Locations¹	Number of Registered Dietitians Working within Setting
Hospital	
Acute care/inpatient	11
Ambulatory care/outpatient	11
Long Term Care	8
Community/Public Health	18
Elderly	3
WIC	3
Consultation/Contract Services	
Individual/Group	16
Education and Research	5
Food and Nutrition Management	2
Supermarket	6
Current Work Setting - Population Estimated	Number of Registered Dietitians Working in Population Setting
Less than 10,000	20
10,000 up to 50,000	9
50,000 up to 100,000	2
100,000 up to 500,000	23

Years Practicing in Dietetics

Under 5 years	13
5-9 years	8
10-19 years	10
20 + years	23

Education Degrees – Received**Number of Registered Dietitians**

Bachelors	29
Masters	23
Doctorate	2
(Dietetic Students)	4

Table 2 Frequently Asked Omega-3 Questions of Registered Dietitians**Known Benefits****Research/Basic Facts**

- What are the findings of research on Omega-3's?
- What is the latest research on omega-3s?
- Why all the interest in Omega-3 in the last 5 years?
- What are the benefits of having Omega 3 in your diet?
- I don't understand the mechanisms of why they are helpful?
- What does Omega 3 do?
- What are functions in body?
- I'm confused about the types of omega 3 fats: DHA, EPA, and ALA?

Special Condition Benefits

- Based upon specific health conditions, what is the current research?
- What are the benefits of omega-3 fatty acids in children?
- What is the research on omega-3 fats and mental health?
- How does omega-3 help with adult macular degeneration?
- Is there any research with Omega 3s and dry eye syndrome?

Controversies/Relationships

- How do I find out the controversies about omega-3?
- How important is ratio of omega 3 to other fats?
- What is the impact of arachidonic acid on the metabolism of DHA?
- I would be interested to learn even more about the beef/omega-3 connection and how they complement each other?

Best Sources**Major sources/Comparisons**

- Are naturally occurring food sources preferable to supplement sources or fortified food sources?
- Greater understanding regarding interaction in the body of natural food sources vs. fortified foods
- More information regarding natural sources vs. fortified sources or supplements
- What are the best sources of Omega-3 fatty acids?

Natural/Fortified Food Sources

- What are the best food sources of Omega-3's?
- Major animal and plant sources of Omega 3s?
- What are the ALA, EPA, DHA, and total Omega-3 content of common grocery store foods?
- How much Omega-3 fatty acid is in specific foods?
- What are the fortified foods available on the market?
- New and emerging food products that contain omega-3?

Supplement Sources

- What is a good oral supplement to take?
- Tell me more about Omega-3 supplementation, how does it rate?
- What over the counter (OTC) supplements are good to recommend for adults, pregnant and lactating mothers?
- Are supplements a good idea for the general population?
- What are the recommended amounts for children and omega 3 supplements?
- Are fish oil supplements ok for pregnant and lactating women?

Menu/Recipe Resources

- Where to find information on Omega-3s to provide to patients/clients?
- Are there any good education materials available?
- How do I get my clients to include more omega-3s?
- What are some recipes that are rich with omega-3s?
- How easy is it to include foods rich in omega-3s?

Recommendations

Related to Specific Audiences

- What is the recommended daily allowance for Omega-3 fatty acids?
- What omega-3s are most beneficial when reducing cardiovascular disease?
- Should dietitians be recommending a certain amount of omega-3 for different client populations?
- What are the safe intake ranges of omega-3 for all ages?
- What is considered the safe upper levels of omega-3 for daily intakes in adults?
- What is the recommended amount for fish oil supplements to reduce triglycerides?
- Are there any health implications if I don't consume omega 3, such as a deficiency?

Related to Safety Concerns

- Other than bleeding, what if any, are potential risks associated with omega-3 supplementation?
- Is there concern with mercury toxicity in obtaining Omega 3s from fish?
- Can a person get too much omega 3 fats, especially with omega 3 fats being added to many foods?
- Is there an identified toxic/harmful level of omega 3?

Note: Questions are ranked within categories from most frequent request (14 times) to least frequent request (2 times).

APPENDICES

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Appendix A

Institutional Review Board Approval Letters



HUMAN RESEARCH PROTECTIONS
Institutional Review Board

January 20, 2006

Dr. Nancy Lewis
Martha Valverde
316 RLH
(0806)

IRB #2005-11-122 EP

TITLE OF PROJECT: **Omega-3 fatty acid Nutrition Education for Registered Dietitians in Nebraska:
Formative and Qualitative Assessment**

Dear Dr. Lewis:

This letter is to officially notify you of the approval of your project by the Institutional Review Board (IRB) for the Protection of Human Subjects. It is the Board's opinion that you have provided adequate safeguards for the rights and welfare of the participants in this study. Your proposal seems to be in compliance with this institution's Federal Wide Assurance 00002258 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46).

Date of EP Review: **12/01/05.**

You are authorized to implement this study as of the Date of Final Approval: **1/20/06**. This approval is Valid Until: **1/19/07**.

1. Enclosed is the IRB approved Informed Consent form for this project. Please use this form when making copies to distribute to your participants. If it is necessary to create a new informed consent form, please send us your original so that we may approve and stamp it before it is distributed to participants.


We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

- Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
- Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
- Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
- Any breach in confidentiality or compromise in data privacy related to the subject or others; or
- Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.


For projects which continue beyond one year from the starting date, the IRB will request continuing review and update of the research project. Your study will be due for continuing review as indicated above. The investigator must also advise the Board when this study is finished or discontinued by completing the enclosed Protocol Final Report form and returning it to the Institutional Review Board.

If you have any questions, please contact Shirley Horstman, IRB Administrator, at 472-9417 or email shorstman1@unl.edu.

Sincerely,


Dan R. Hoyt, Chair
for the IRB

cc: Faculty Advisor


Shirley Horstman
IRB Administrator



IRB#2005-11-122 EP Date Approved: 1/20/06 Valid Until: 1/19/07
--

DEPARTMENT OF NUTRITION AND HEALTH SCIENCES

UNL IRB# _____

Informant Interview Informed Consent Form

You have been selected to participate in a research project entitled **“Developing and Administering a Survey of Omega-3 fatty acid Patient Intervention Practices among Registered Dietitians”**. The purpose of the project is to identify current practice of the registered dietitian (RD) in relation to omega-3 fatty acid interventions with clients, and to obtain feedback on several omega-3 fatty acid patient education and assessment tools.

We are interested in helping dietitians counsel and educate their patients on n-3 fatty acids. Our goal is to help dietitians to include information about n-3 in patient contact. We want to design tools that will be useful for this to occur. We are also exploring if a web site would be helpful or useful in RD education and patient education.

Your participation will involve being interviewed for approximately forty-five minutes to one hour concerning your current patient intervention practices with omega-3 fatty acids and your feedback on several tools developed for patient education and assessment of omega-3 fatty acid dietary intakes. Participation in this study involves sitting in a comfortable room (a convenient time and location arranged with you in advance), talking to a colleague and having the conversation documented in writing to a list of interview questions.

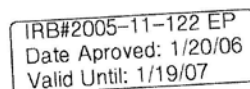
There are no known risks to this study. As this research identifies useful tools and continuing education needs of registered dietitians, it will serve to focus our development of a web based omega-3 fatty acid educational tool for your professional use. This will position you as a professional with expertise in omega-3 fatty acid patient care services within your medical community.

Any information obtained during this study which could identify you will be kept strictly confidential. All information collected will be stored in a locked office of the investigator and will only be seen by the research team during the study and for five years after survey completion. The results of this research may be presented at professional meetings and published in scientific journals. You will not be identified in any way, and results will be presented only in aggregate form.

We cannot offer any compensation for your participation in this research. You may ask questions concerning this research, and have those questions answered before agreeing to participate in or during the study. You may call the research staff concerning this study (office) (402) 472-7984 or email dietitianresearch1@yahoo.com. If you have any questions about your rights as a research participant that have not been answered by the investigator or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

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(402) 472-3716 / FAX (402) 472-1587



DEPARTMENT OF NUTRITION AND HEALTH SCIENCES

Participation in this study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or the University of Nebraska. Your decision will not result in any loss of benefits to which you are otherwise entitled.

You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep.

Signature of the Participant:

Signature of the Participant

Date

Name and phone number of investigator(s)

Nancy M. Lewis, PhD, R.D., Principal Investigator Office: (402) 472-4633

Martha Valverde, M.P.H., R.D., L.M.N.T., Research Staff Office: (402) 472-7984

110 Ruth Leverton Hall / P.O. Box 830806 / Lincoln, NE 68583-0806

(402) 472-3716 / FAX (402) 472-1587

RD Omega-3 Nutrition Education Pilot Testing Demographic Information

1. Please mark the following categories which currently apply to you:

- ☐ Registered Dietitian (RD)
☐ Licensed Medical Nutrition Therapy Provider (LMNT)
☐ Provide client counseling or education in one-on-one or group setting

2. Please mark client audiences you are currently serving.

- ☐ Elderly; ☐ General Adult; ☐ Youth (12-18); ☐ Children (2-12); ☐ Infants (0-2)
☐ Cardiac; ☐ Diabetes; ☐ Renal; ☐ Weight Management; ☐ WIC; ☐ School;
☐ Chronic Illness; ☐ Other (please list) _____

3. Please mark those categories which best describe your current work setting(s)?

- ☐ Hospital
☐ Acute care/inpatient
☐ Ambulatory care/outpatient
☐ Long-Term Care
☐ Community, Public Health
☐ Women, Infants, and Children
☐ Elderly
☐ Other (please list) _____
☐ Consultation and Business
☐ Individual/Group
☐ Business
☐ Education and Research
☐ Food and Nutrition Management

4. How long have you been practicing dietetics?

- ☐ under 5 yrs, ☐ 5-9 yrs, ☐ 10-19 yrs, ☐ 20 + yrs

5. What is your educational background?

- ☐ Bachelors, ☐ Masters, ☐ Doctors, ☐ Other _____

6. What would be a population estimate for your current work setting?

- ☐ Under 10,000 Population
☐ 10,000 up to 50,000 Population
☐ 50,000 up to 100,000 Population
☐ 100,000 up to 500,000 Population



HUMAN RESEARCH PROTECTIONS
Institutional Review Board

December 13, 2006

Dr. Nancy Lewis
Martha Valverde
316 RLH
(0806)

IRB# 2005-11-122 EP

TITLE OF PROJECT: **Omega-3 fatty acid Nutrition Education for Registered Dietitians in Nebraska:
Formative and Qualitative Assessment**

Dear Dr. Lewis:

This is to officially notify you of the approval of your project's Continuing Review by the Institutional Review Board for the Protection of Human Subjects. It is the committee's opinion that you have provided adequate safeguards for the rights and welfare of the subjects in this study. Your proposal seems to be in compliance with DHHS Regulations for the Protection of Human Subjects (45 CFR 46).


We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:


- Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
- Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
- Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
- Any breach in confidentiality or compromise in data privacy related to the subject or others; or
- Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

It is the responsibility of the principal investigator to provide the Board with a review and update of the research project each year the project is in effect. This approval is valid until **January 19, 2008**.

If you have any questions, please contact Shirley Horstman, IRB Administrator, at 472-9417 or email at shorstman1@unl.edu.

Sincerely,


Dan R. Hoyt, Chair
For the IRB


Shirley Horstman
IRB Administrator



May 11, 2007

HUMAN RESEARCH PROTECTIONS
Institutional Review Board

Dr. Nancy Lewis
Martha Valverde
Nutrition & Health Sciences
316 RLH 0806

IRB# 2005-11-122 EP

TITLE OF PROJECT: **Omega-3 Fatty Acid Nutrition Education for Registered Dietitians in Nebraska: Formative and Qualitative Assessment.**

Dear Dr. Lewis:

The Institutional Review Board for the Protection of Human Subjects has completed its review of the Request for Change in Protocol submitted to the IRB.

1. It has been approved to add web review questionnaire data from current participants. This was completed by board members in preparation for their July 2006 board meeting.
2. It has been approved for you to include data from field notes observations made by you during the fall 2006. These are not specific to any one individual.
3. Enclosed is the IRB approved Informed Consent form for this project. Please use this form when making copies to distribute to your participants. If it is necessary to create a new informed consent form, please send us your original so that we may approve and stamp it before it is distributed to participants.

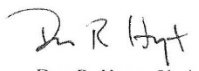
We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

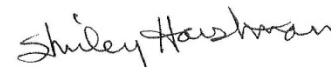
- Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
- Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
- Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
- Any breach in confidentiality or compromise in data privacy related to the subject or others; or
- Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This letter constitutes official notification of the approval of the protocol change. You are therefore authorized to implement this change accordingly.

If you have any questions, please contact Shirley Horstman, IRB Administrator, at 472-9417 or email shorstman1@unl.edu.

Sincerely,


Dan R. Hoyt, Chair
for the IRB


Shirley Horstman
IRB Administrator



HUMAN RESEARCH PROTECTIONS
Institutional Review Board

January 22, 2008

Dr. Nancy Lewis
Martha Valverde
316 RLH
(0806)

IRB# 2005-11-122 EP

TITLE OF PROJECT: **Omega-3 fatty acid Nutrition Education for Registered Dietitians in Nebraska: Formative and Qualitative Assessment**

Dear Dr. Lewis:

The Institutional Review Board for the Protection of Human Subjects has completed its review of the Request for Change in Protocol submitted to the IRB.

1. It has been approved to pilot test preliminary study results using survey monkey to collect data.
2. It has been approved to add Jennifer Yen as a research assistant.
3. It has been approved to offer a \$20.00 gift card as compensation to research participants who complete feedback correspondence.
4. It has been approved to recruit registered dietitians.

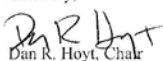
We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

- Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
- Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
- Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
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- Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This letter constitutes official notification of the approval of the protocol change. You are therefore authorized to implement this change accordingly.

If you have any questions, please contact Shirley Horstman, IRB Administrator, at 472-9417 or email shorstman1@unl.edu.

Sincerely,


Dan R. Hoyt, Chair
for the IRB



DEPARTMENT OF NUTRITION AND HEALTH SCIENCES

Omega-3 Nutrition Education - Pilot Testing: Informed Consent Form

You have been selected to participate in a research project entitled “**Omega-3 fatty acid Nutrition Education for Registered Dietitians in Nebraska: Formative and Qualitative Assessment**”. The purpose of the project is to identify current practice of the registered dietitian (RD) in relation to omega-3 fatty acid interventions with clients, and to obtain feedback on omega-3 fatty acid education and assessment tools.

We are interested in helping dietitians counsel and educate their patients on n-3 fatty acids. Our goal is to help dietitians to include information about n-3 in patient contact. We want to design tools that will be useful for this to occur. We are also exploring computer technology applications useful in RD and patient education.

Your participation involves reviewing Omega-3 Learning Module components and providing written feedback on their usefulness within your professional practice. Feedback will be collected using email correspondence and online survey services provided by researcher. Primary communication with researcher throughout study will be by email correspondence with telephone and in-person communication on as needed basis. Participation in this study involves having computer access to internet services from your work, home, or public library. You will be asked to view email attachments in the form of word documents, power point slides, and website links, and complete online survey questionnaires which report your feedback to researcher.

There are no known risks to this study. As this research identifies useful tools and continuing education needs of registered dietitians, it will serve to focus our development of computer based omega-3 fatty acid educational tools for your professional use. This will position you as a professional with expertise in omega-3 fatty acid patient care services within your medical community.

Any information obtained during this study which could identify you will be kept strictly confidential. All information collected will be stored in a locked office of the investigator and will only be seen by the research team during the study and for five years after pilot testing completion. The results of this research may be presented at professional meetings and published in scientific journals. You will not be identified in any way, and results will be presented only in aggregate form.

Compensation for your participation in this research will include a \$20.00 gift card to a local store in your area upon study completion. You may ask questions concerning this research, and have those questions answered before agreeing to participate in or during the study. You may call the research staff concerning this study (office) (402) 472-7984 or email marthavrd@yahoo.com. If you have any questions about your rights as a research participant that have not been answered by the investigator or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

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(402) 472-3716 / FAX (402) 472-1587



DEPARTMENT OF NUTRITION AND HEALTH SCIENCES

Participation in this study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or the University of Nebraska. Your decision will not result in any loss of benefits to which you are otherwise entitled.

You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep.

Signature of the Participant:

Signature of the Participant

Date

Name and phone number of investigator(s)

Nancy M. Lewis, PhD, R.D., Principal Investigator Office: (402) 472-4633

Martha Valverde, M.P.H., R.D., L.M.N.T., Research Staff Office: (402) 472-7984

110 Ruth Leverton Hall / P.O. Box 830806 / Lincoln, NE 68583-0806

(402) 472-3716 / FAX (402) 472-1587

Website Research Survey



IRB# 200511122 EP
Date Approved: 08/22/2008
Valid Until: 01/19/2009

1. Consent Form

DEPARTMENT OF NUTRITION AND HEALTH SCIENCES

UNL IRB# 2005-11-122 EP

Valid Until: 01/19/09

Learnomega3rd Website Survey: Informed Consent

You have been selected to participate in a research project entitled "Omega-3 fatty acid Nutrition Education for Registered Dietitians in Nebraska: Formative and Qualitative Assessment." The purpose of the project is to identify current practice of the registered dietitian (RD) in relation to omega-3 fatty acid interventions with clients, and to obtain feedback on omega-3 fatty acid education and assessment tools.

Your participation will involve approximately 1 hour 15 minutes total time viewing Learnomega3rd Website (35-45 minutes), completing online survey (10-15 minutes), and a brief follow up contact with researcher by email or telephone (5-10 minutes). Participation in this study involves having computer access to internet services from your work, home, or public library. You will be asked to view website attachments in the form of word documents, power point slides, and website links, and complete secure online survey questionnaire which reports your feedback to researcher.

There are no known risks to this study. As this research identifies useful tools and continuing education needs of registered dietitians, it will serve to focus our development of computer based omega-3 fatty acid educational tools for your professional use. This will position you as a professional with expertise in omega-3 fatty acid patient care services within your medical community.

Any information obtained during this study which could identify you will be kept strictly confidential. All information collected will be stored in a locked office of the investigator and will only be seen by the research team during the study and for five years after pilot testing completion. The results of this research may be presented at professional meetings and published in scientific journals. You will not be identified in any way, and results will be presented only in aggregate form.

Compensation for your participation in this research will include a \$20.00 gift card to a local store in your area upon study completion. You may ask questions concerning this research, and have those questions answered before agreeing to participate in or during the study. You may call the research staff concerning this study (office) (402) 472-7984 or email marthavrd@yahoo.com. If you have any questions about your rights as a research participant that have not been answered by the investigator or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Participation in this study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or the University of Nebraska. Your decision will not result in any loss of benefits to which you are otherwise entitled.

You are voluntarily making a decision whether or not to participate in this research study. By completing and submitting your responses to this survey, your consent is implied. You may print a copy of this consent form for your records.

Name and phone number of Investigator(s)

Nancy M. Lewis, PhD, R.D., Principal Investigator Office: (402) 472-4633

Martha Valverde, M.P.H., R.D., L.M.N.T., Research Staff Office: (402) 472-7984

* 1. Do you agree to the consent information listed on this form?

- ☐ Yes, I agree to the above consent form
- ☐ No, I don't agree to the above consent form

Appendix B

Informant Interview Question Guide

RD Informant Interview – Guide

Interview Outline

Time	Topic
------	-------

5-10 min.	Introduction
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5 min	Obtain Signed Informed Consent forms Complete Demographic/Screening Questions
-------	--

15 minutes

5-10 min.	Questions
-----------	-----------

1. RD computer usage for continuing education and for patient education: important elements
2. Access to available web resources (i.e. research, education, tools): important elements
3. General RD learning practices and general patient intervention practices with omega-3 fatty acids: what does current practice look like?
4. Resources for measuring dietary omega-3 intakes: comments and ideas
5. Resources for omega-3 fatty acid education: comments and ideas

25-50 minutes

5-10 min.	Conclusion and any further comments
-----------	-------------------------------------

Introduction

Interviewer introduces self and thanks the respondent for consenting to give the interview and states that their comments will be kept confidential.

We are doing an n-3 fatty acid project at UNL and we are interested in helping dietitians counsel and educate their patients on n-3 fatty acids. Our goal is to understand what dietitians want to know about n-3 fatty acids and help dietitians to include information about n-3 in patient contact. We want to design tools that will be useful for this to occur. We are seeking information about the continuing education practices and computer usages of dietitians. We also need to explore if a web site would be helpful or useful in RD education and patient education.

(Added wording after first interview 4/4/06)

Introduction

We are interested in:

- **How you like to learn**
- **How you like to facilitate patient learning**
- **How you use your computer for learning**
- **How you facilitate patient's using computer for learning**
- **What motivates and facilitates your learning via computer routes**
- **What motivates and facilitates your learning about omega-3 fatty acids**

Demographic Information

Would you consider yourself a part of our target audience for this project according to the screening criteria listed below?

- ☐ Current Registered Dietitian (RD)
☐ Current Licensed Medical Nutrition Therapy Provider (LMNT)
☐ Current counseling or education of patients/clients in one-on-one or group setting

How would you categorize your clientele?

- ☐ Elderly, ☐ General Adult, ☐ Youth (12-18), ☐ Children (2-12), ☐ Infants (0-2)
☐ Cardiac, ☐ Diabetes, ☐ Renal, ☐ Weight Mngt., ☐ WIC, ☐ School, ☐ Chronic
 Illness, ☐ Other (please list) _____

How would you describe your work setting?

- ☐ Hospital
 ☐ Acute care/inpatient
 ☐ Ambulatory care/outpatient
☐ Long-Term Care
☐ Community, Public Health
 ☐ Women, Infants, and Children
 ☐ Elderly
 ☐ Other (please list) _____
☐ Consultation and Business
 ☐ Individual/Group
 ☐ Business
☐ Education and Research
☐ Food and Nutrition Management

How long have you been practicing dietetics?

- ☐ under 5 yrs, ☐ 5-9 yrs, ☐ 10-19 yrs, ☐ 20 + yrs

What is your educational background?

- ☐ Bachelors, ☐ Masters, ☐ Doctors, ☐ Other _____

What would be a population estimate for your current work setting?

- ☐ Under 10,000 Population
☐ 10,000 up to 50,000 Population
☐ 50,000 up to 100,000 Population
☐ 100,000 up to 500,000 Population

RD computer usage for continuing education and for patient education: important elements

Do you currently use the web for professional educational services?

- **How use computer for learning**

What websites are most helpful? Why?

How comfortable are you in using the computer for continuing education?

- **Comfort level with using computer for learning**

Very comfortable, Comfortable, Very uncomfortable, Undecided

What barriers do you foresee using the computer for continuing education?

- **Barriers to computer use as learning tool**

Do you currently use the web for patient education?

- **How use computer for patient learning**

What websites are helpful? Why?

How comfortable are you in using the computer for patient education?

Comfort level with using computer for patient learning

Very comfortable, Comfortable, Very uncomfortable, Undecided

What barriers do you foresee using the computer for patient education?

- **Barriers to using computer for patient learning**

Please describe your current computer access:

At Work: At Home: Other Locations: Not Available:

Please estimate the current age of your computer hardware/software:

Work: ☐ > 4 years old, ☐ > over 3 years old, ☐ < 2-3 years, ☐ 1 year or less

Home: ☐ > 4 years old, ☐ > over 3 years old, ☐ < 2-3 years, ☐ 1 year or less

If you do have internet access, do you remember when you last purchased it?

What type of connection do you have to the internet? Mode used, date last purchased

Work: ☐ dial up (modem), ☐ DSL (high speed), ☐ Cable, ☐ other _____

Home: ☐ dial up (modem), ☐ DSL (high speed), ☐ Cable, ☐ other _____

What type of activities do you use a computer for:

Work: (email, internet, word processing, medical charting, entertainment, shopping)

Home: (email, internet, word processing, medical charting, entertainment, shopping)

What functions do you perform on computer related to patient services? (examples: data collection regarding outcomes, counseling notes, patient electronic charting).

Access to available web resources for omega-3 fatty acids (i.e. research, education, tools): important elements

1. How do you currently obtain your continuing education? **Continuing Education for credit; Other learning credit/non credit like job related, updates, professional, skills building, personal interest**
 - a. Onsite methods: Conferences, workshops, seminars
 - b. Printed methods: Newsletters, publications, Journals
 - c. Internet methods: Email, Website, Other: _____
 - d. Other; please list _____

2. What design elements would be important to you in an RD educational web site?
 - a. Home page formats: Which of the following samples is most appealing? What elements make them appealing? **From examples, highlight elements important to you**
 - i. ADA
 - ii. NDA
 - iii. UNL
 - iv. UNI
 - v. MedPlus
 - b. How would you like to access an educational web site for RDs.? **Preferred access routes to web site**
 - i. NDA site link
 - ii. ADA site link
 - iii. Email site link
 - iv. Postcard notification with web site link
 - v. Other methods _____
 - c. How would you like updates when new information is added to web site? **Preferred update notification methods**
 - d. **Preferred design for information layout in web pages**
 - e. Links: What information needed with link for most effective use? (example: description of link, identifying words like research, education, resource)
 - f. Frequently asked questions (links to answers): Would this format be helpful?
 - g. Evidenced Based Guides to Practice: (See this question on next page, explore thoughts and current use)

3. How much time per computer session do you currently spend when accessing educational information? (i.e. minutes)
 - a. **Daily updates**
 - b. **Preparing for clients,**
 - c. **Preparing for research, talks, writing, classes, etc.**

General RD learning practices and general patient intervention practices with omega-3 fatty acids: what does current practice look like?

A. RD Learning Practices

1. What draws your attention to learning about omega-3 fatty acids?
2. What would draw your attention to learning about omega-3 fatty acids in the future?
3. As a dietitian what do you need to know about the chemical structure of the family of omega-3 fatty acids?
4. As a dietitian what do you need to know about the physiological properties of the family of omega-3 fatty acids?
5. What are your current thoughts on incorporating evidence based guidelines into your dietetic practice? How would you access these guidelines?

B. RD Patient Intervention Practices

1. What work do you now do with n-3 fatty acids in your patient population?
2. When did you start to discuss n-3 fatty acids?
3. What motivated you to include n-3 fatty acids education with patients?
4. What were your sources of learning about the n-3 fatty acids?
5. If you do not include n-3 fatty acids in educating patients, can you tell me more about that?

Resources for measuring dietary omega-3 intakes: comments and ideas

Omega-3 Food Frequency Questionnaire

Introduction: Review prior use as research instrument for measuring n-3 fatty acid intake. Explain our interest in adjusting tool for use by clinicians for measuring n-3 fatty acid intake.

1. As you take time to look at it, do you have questions about it?
2. What do you like, dislike about it?
3. How useful would this be in your practice? Can you give me specific examples on how you would use it?
4. If this FFQ is on the web and calculates intakes, would you use it? Explain.
5. If this FFQ is on a website and a RD or patient could complete and obtain n-3 fatty acid intake, what are your thoughts?
6. How useful would this tool be on a website be for you personally? For patients?
7. Would you use the printed FFQ in your practice? Explain.

Resources for omega-3 fatty acid education: comments and ideas

Omega-3 Food Guides

Following are three formats for presenting omega-3 food content information. As you review these please identify which ones you would use and in what manner?

A: landscape: food groups listed according to high-low amounts omega-3

B: portrait: food groups listed according to high-low amounts omega-3

C: portrait: foods groups chart reference by serving size and omega-3 content

1. As you look at it, do you have questions about it?
2. What do like, dislike?
3. If you could use this material, can you give me specific examples on how you would use it?
4. What would make it more useful? What suggestions, if any, do you have for changes?
5. If you were to create a guide for your patients on n-3 fatty acids, what would be the features (pages, format, content etc.)?
6. If this guide was on a website would you print it for use?

How useful would you rate the following tools in providing patient education?

<u>Cookbook</u>	Very useful	Useful	Not useful	Undecided
<u>Menu Guide</u>	Very useful	Useful	Not useful	Undecided
<u>Dining Out Guide</u>	Very useful	Useful	Not useful	Undecided
<u>Fact Sheet</u>	Very useful	Useful	Not useful	Undecided

What other tools would you find useful?

Conclusion

Are there questions or comments we have not discussed?

Thank you for your time and answers to our questions.

Appendix C

Informant Interview Data Analysis Methodology

Informant Interview - Data Analysis Methodology

A qualitative phenomenology approach is used to analyze data from informant interviews with registered dietitians. Below is a detailed description of these steps:

Phase I

Getting a feel for the Data

- Read through text, make margin notes, form initial codes.
- Gain a feeling for informant interview descriptions of their experiences with learning, computers, and omega-3 fatty acids.

Instructions: Researcher 1 and Outside researcher read through transcripts independently. Outside researcher gives a copy of her initial notes and codes to Researcher 1 for processing.

Extracting Significant Statements

- Find and list significant statements of informants regarding initial codes identified (phrases, sentences related to learning, computers, and omega-3 fatty acids).
- Make an exhaustive list of unduplicated significant statements.

Instructions: Researcher 1 and outside researcher independently make exhaustive list of significant statements. Outside researcher gives a copy of list to Researcher 1 for generation of combined list of non-repetitive statements. Researcher 1 generates combined list of statements and returns to outside researcher for validation.

Researcher 1 and outside researcher arrive at agreed upon exhaustive list of non-repetitive significant statements.

Phase II

Researcher describes meaning of the experience related to them

Instructions: Researcher 1 describes meaning of experience with learning, computers and omega-3 fatty acids. Researcher 1 describes relationship as researcher to informant audience.

Formulate Meanings of Significant Statements

- Spell out the meaning of each significant statement.
- Formulations discover and bring out those meanings hidden in the various contexts of the phenomenon that are present in the original descriptions.

Instructions: Researcher 1 assigns meanings to each of significant statements and starts to identify emerging themes. Researcher 1 checks assigned meanings against original data for validation.

Cluster Meaning Statements into Meaning Units (Common Themes)

- From aggregate formulated meanings statements develop clusters of common meaning statements into theme units.

Instructions: Researcher 1 identifies emerging themes and clusters meaning statements within these theme units. Researcher 1 checks emerging themes against original data for validation.

Phase III

Meaning Units (common themes) validated with original informant interview descriptions

- Anything in original not accounted for in common theme clusters?
- Anything proposed in cluster which was not in the original descriptions?

Instructions: Researcher II is given for review and validation: interview transcripts (original); list of significant statements, meaning statements, identified common themes and grouped meaning statements. Researcher I and II discuss discrepancies in data analysis documents and come to agreed upon conclusions regarding data meanings and themes. Researcher 1 makes revisions and adjustments to reflect original data.

Phase IV

Write “Exhaustive Description” or “Essence” of informants’ experience with learning, computers, and omega-3 fatty acids

- This is a cumulative statement in paragraph form describing the overall experience of informants with learning, computers, and omega-3 fatty acids.

Instructions: Researcher 1 generates exhaustive description of informant experiences with learning, computers, and omega-3 fatty acids in paragraph form from common themes and meaning statement clusters. Researcher II validates exhaustive description. Selected interview informants are invited to validate findings and interpretation: significant statement list, meanings of statement list, common themes and grouped meaning statements, and “exhaustive description” of informant

experience. Researcher 1 makes revisions and adjustments from comments received from interview informants to reflect original data and informants meanings.

Phase V

Write up data for peer reviewed research article; submit article for publication

Appendix D

Instrument Development Website and Online Survey

Instrument Development – Website and Online Survey

Website Development

Website design is based on formative research findings with dietitians identifying their omega-3 online learning needs. Key themes included: using a question-based learning approach, adaptability of educational materials for multiple audiences, and multimedia applications allowing for links to omega-3 websites, resources, and current published research articles

Major Omega-3 content areas chosen for website navigation were based on dietitian pilot testing of omega-3 learning modules and included: Basic Facts, Major Health Benefits, Common Food Sources, Recipe Ideas, Links, and Resources. See Table 1 Appendix D.

Online Survey Development

An online survey assessment tool was developed using Survey Monkey professional services package and pilot tested for clarity and functionality with a convenience sample of dietitians and professionals in the academic setting. IRB approval for research survey was obtained. Final survey contained twenty questions the first being informed consent, following 11 survey questions, ending with 7 demographic questions and an opportunity for any further text feedback comments of participants. A basic website feedback survey template available from survey monkey was selected and modifications added to tailor it to learnomega3rd website feedback needs. Scale and text questions were included in survey. Demographic information collected was formatted for comparisons to ADA member survey categories for comparisons. Text questions were

analyzed using content analysis methods to identify common categories, questions of participants and then to quantify frequency of each category or question as reported by research participants. Scale questions are reported as descriptive group rating responses. Comparisons between dietitian groups based on demographics were unable to be made due to small sample size.

Online survey assessment direct link was made available on learnomega3rd website along with research participation directions. Further access to online survey made available to potential participants via follow-up email invitation through direct link. PDF version of survey was made available to several participants who experienced difficulties with online survey completion and researcher then manually entered survey data into online survey collection bank.

Data collection completed using encryption services available by Survey Monkey to ensure confidentiality. Data result exported in excel file for further analysis by researcher using SPSS 16.0 data analysis software package.

Quantitative and categorical variables were used in the survey instrument. Descriptive statistics were used to report participant demographics by frequencies, website ratings by scale, and text analysis by frequency after conducting content analysis of text response questions.

Outcome measures: What are your omega-3 fatty acid questions? How will you use information accessed from website? Did you find answers to your omega-3 fatty acid questions using website resources? How easy or difficult was it to find your answers? How long did it take you to find answers? Is this time frame acceptable to you? How

would you rate the overall website? How would you rate the online information provided on website? What feedback would you have for improving website? What is the likelihood you would use website again if access were provided?

Demographics collected: current work setting, audiences served, and years practicing dietetics, educational background, population of area within work setting, and contact information for researcher follow-up and providing financial compensation.

Table 1 Learning Module Development

Initially, nine modules were developed and divided into two main groupings **presented in a table of contents format**. These groupings were used for print manual, adobe file package, and CD-ROM package.

TABLE OF CONTENTS

(Front of Manual, Beginning file in Adobe Package, Top of CD-ROM file listings)

Consumer/Dietitian Basic Education Materials

1. Lesson Plan—Consumer
2. Power Point Presentation—Omega-3 Overview
3. Learning Guide
4. Learning Activities
5. Educational Handouts

Dietitian/Professional Additional Materials

1. Lesson Plan—Dietitian
2. Power Point—Online Resources
3. Learning Activities
4. Online Resources

During pilot testing, the **table of contents was repackaged into six major categories** to facilitate quicker, friendlier access to individual files housed on CD-ROM.

READ ME FIRST Navigational Guide

(Power Point Slides – Linked to individual files housed on CD-ROM)

Major Categories – Site Map

Click on each topic to see what's included

1. Basic Facts
2. Major Health Benefits
3. Common Food Sources
4. Recipe Ideas
5. Links
6. Resources

Further pilot testing, drove **final repackaging** of learning modules to accommodate web based storage and access using topic specific website like an online library. **Four navigational systems are incorporated into web page navigation** – sidebar, center page themes, bottom links, and top right site search box.

WEBSITE

(Top left hand sidebar)

Navigation

1. Home
2. Sitemap
3. Basic Facts
4. Beef & Omega-3
5. Continuing Education
6. Educational Resources
7. Food Sources
8. Major Health Benefits
9. Research
10. Websites

At the end of pilot testing, the website navigational systems were selected for use while conducting website research survey with registered dietitians recruited from Nebraska Dietetic Association Membership email list serve.

Results from website research survey will further inform a larger representation of frequently asked questions of dietitians and category headings which facilitate satisfactory access to information for answering dietitian omega-3 fatty acid questions.

Appendix E

Website Research Survey

Website Research Survey

1. Consent Form

DEPARTMENT OF NUTRITION AND HEALTH SCIENCES

UNL IRB# 2005-11-122 EP

Valid Until: 01/19/10

Learnomega3rd Website Survey: Informed Consent

You have been selected to participate in a research project entitled "Omega-3 fatty acid Nutrition Education for Registered Dietitians in Nebraska: Formative and Qualitative Assessment". The purpose of the project is to identify current practice of the registered dietitian (RD) in relation to omega-3 fatty acid interventions with clients, and to obtain feedback on omega-3 fatty acid education and assessment tools.

Your participation will involve approximately 1 hour 15 minutes total time viewing Learnomega3rd Website (35-45 minutes), completing online survey (10-15 minutes), and a brief follow up contact with researcher by email or telephone (5-10 minutes). Participation in this study involves having computer access to internet services from your work, home, or public library. You will be asked to view website attachments in the form of word documents, power point slides, and website links, and complete secure online survey questionnaire which reports your feedback to researcher.

There are no known risks to this study. As this research identifies useful tools and continuing education needs of registered dietitians, it will serve to focus our development of computer based omega-3 fatty acid educational tools for your professional use. This will position you as a professional with expertise in omega-3 fatty acid patient care services within your medical community.

Any information obtained during this study which could identify you will be kept strictly confidential. All information collected will be stored in a locked office of the investigator and will only be seen by the research team during the study and for five years after pilot testing completion. The results of this research may be presented at professional meetings and published in scientific journals. You will not be identified in any way, and results will be presented only in aggregate form.

Compensation for your participation in this research will include a \$20.00 gift card to a local store in your area upon study completion. You may ask questions concerning this research, and have those questions answered before agreeing to participate in or during the study. You may call the research staff concerning this study (office) (402) 472-7984 or email marthavrd@yahoo.com. If you have any questions about your rights as a research participant that have not been answered by the investigator or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Participation in this study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or the University of Nebraska. Your decision will not result in any loss of benefits to which you are otherwise entitled.

You are voluntarily making a decision whether or not to participate in this research study. By completing and submitting your responses to this survey, your consent is implied. You may print a copy of this consent form for your records.

Name and phone number of investigator(s)

Nancy M. Lewis, PhD, R.D., Principal Investigator Office: (402) 472-4633

Martha Valverde, M.P.H., R.D., L.M.N.T., Research Staff Office: (402) 472-7984

1. Do you agree to the consent information listed on this form?

- ☐ Yes, I agree to the above consent form
- ☐ No, I don't agree to the above consent form

Website Research Survey

2. Website Survey Questions

2. What questions do you have regarding Omega-3 fatty acids?

1.
2.
3.
- Other
- Limited Interest (please explain)

3. How will you use information resources accessed from website?

- ☐ dietary planning
- ☐ dietary decision making
- ☐ medical nutrition therapy counseling
- ☐ group education
- ☐ individual education
- ☐ staying current on latest research
- ☐ topical background review

Other (please specify)

4. Did you find answers to your Omega-3 fatty acid questions?

- ☐ Yes, all of the answers
- ☐ Yes, some of the answers
- ☐ No, none of the answers

Other (please specify)

5. If you did not find any or all of what you needed, please tell us what information you were looking for.

6. Please tell us how easy it is to find information on the site.

- ☐ Very Easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very Difficult

Website Research Survey

7. How much time did it take to find information which answers your questions?

- ☐ under 30 minutes
☐ between 30 minutes - 1 hour
☐ over 1 hour

8. Did website provide information to answer your questions within anticipated time frame?

- ☐ Yes, time frame satisfactory
☐ Yes, time frame somewhat satisfactory
☐ No, information to answer questions not found
☐ No, time frame unsatisfactory
☐ I have no questions at this time

9. What is your overall impression of the site?

	Below Expectations	Meets Expectations	Exceeds Expectations
Professional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visually Pleasing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. What is your overall impression of the online information provided on website?

	Below Expectations	Meets Expectations	Exceeds Expectations
Relevant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Credible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. What is the likelihood that you would use website again if professional access were provided?

- ☐ Very Likely
☐ Likely
☐ Unsure
☐ Unlikely
☐ Very Unlikely

12. Please add any comments you have for improving the website. We welcome suggestions on specific areas for improvements, features you would like to see added to the site, and examples of what you consider good websites.

Website Research Survey

3. Demographics

13. Which categories apply to your current work setting?

- ☐ Registered Dietitian (RD)
- ☐ Licensed Medical Nutrition Therapy Provider (LMNT)
- ☐ Provide counseling in one-on-one or group setting
- ☐ Provide nutrition education in one-on-one or group setting

Other (please specify)

14. Which audience/s are you currently serving?

- | | | |
|---|--|--|
| <input type="checkbox"/> Elderly | <input type="checkbox"/> Infants (0-2) | <input type="checkbox"/> Weight Management |
| <input type="checkbox"/> General Adult | <input type="checkbox"/> Cardiac | <input type="checkbox"/> WIC |
| <input type="checkbox"/> Youth (12-18) | <input type="checkbox"/> Diabetes | <input type="checkbox"/> School |
| <input type="checkbox"/> Children (2-11) | <input type="checkbox"/> Renal | <input type="checkbox"/> Chronic Illness |
| <input type="checkbox"/> Other (please specify) | | |

15. Which categories best describe your current work setting/s?

- | | | |
|--|---|--|
| <input type="checkbox"/> Hospital Acute care/inpatient | <input type="checkbox"/> Women, Infants, and Children | <input type="checkbox"/> Business |
| <input type="checkbox"/> Hospital Ambulatory care/outpatient | <input type="checkbox"/> Elderly | <input type="checkbox"/> Education & Research |
| <input type="checkbox"/> Long-Term Care | <input type="checkbox"/> Consultation & Business Individual | <input type="checkbox"/> Food & Nutrition Management |
| <input type="checkbox"/> Community, Public Health | <input type="checkbox"/> Consultation & Business Group | |

Other (please specify)

16. How long have you been practicing dietetics?

- ☐ Under 5 years
- ☐ 5-9 years
- ☐ 10-19 years
- ☐ 20+ years

Website Research Survey

17. What is your educational background?

☐ Bachelors

☐ Masters

☐ Doctors

Other (please specify)

18. What is the population size of your current work setting/s?

☐ Under 10,000

☐ 10,000 to 50,000

☐ 50,000 to 100,000

☐ 100,000 to 500,000

19. Please provide contact information to facilitate research participation compensation.

Name:

Company:

Address:

Address 2:

City/Town:

State:

ZIP:

Country:

Email Address:

Phone Number:

Website Research Survey

4. Survey Completion

20. Thank you for viewing Learnomega3rd Website designed for registered dietitians. Feel free to add any additional comments you may have in the following text box.

Appendix F

Website Survey Data Analysis Methodology

Website Survey – Data Analysis Methodology

To assess usefulness of Learnomega3rd website, dietitians from statewide email list serve were invited to complete an online survey (Survey Monkey.com) where they listed their primary omega-3 questions and then indicated if they were able to find answers to their questions using website resources.

Descriptive statistics are used to report: participant demographics, website information uses, and ratings of website usefulness in answering omega-3 questions. Content analysis methods are used for analysis of survey questions with text responses: dietitian omega-3 questions, and open-ended website feedback.

Descriptive data analysis of categorical and scale survey questions

Excel spreadsheets were exported from survey monkey for further data analysis using SPSS 16 software program package. Codes for each variable were developed and used in reporting aggregate findings for variables assessed. Only completed surveys are included in data analysis findings.

Content Analysis of text response survey questions

Text responses from all completed surveys were transferred into an excel spreadsheet program to conduct an initial content analysis. From this a codebook was developed and used to further analyze text response data using SPSS 16 software program.

Content analysis of omega-3 question texts reported by participants was done by an initial reading through composite listing of text questions by researcher to identify

major groupings: key words, categories, and themes. Following this initial reading, questions were sorted into all major groups that applied. An independent research consultant verified content analysis process being used during data analysis sorting process. A code book was developed by researcher after sorting and resorting process had identified 13 major grouping common to question texts. Codes were added to text questions using SPSS data software and frequency distributions were determined. Question complexity was determined by how many categories each question could be categorized into using code book.

Content analysis was also performed in the analysis of website feedback for improving website. Four main areas of feedback were identified, coded, and quantified for reporting of results.

Procedures for Content Analysis

1. Initial reading of all text responses identified subject headings for key interest areas
2. All text responses sorted by subject headings to test “best fit” of categories with data
3. Questions/comments assigned level of complexity to allow for general and specific topic searches
4. Revisions made to categories to accommodate website navigation formatting
5. Thirteen content codes identified; all text responses assigned content codes for each level of complexity; frequency analysis run on data
6. Content code headings adjusted to reflect “best fit” of categories with data according to interest

Code Book – coding schemes developed for data analysis of website survey text responses based on content analysis of text responses

CONTENT CODES

- 1 *Known Benefits*
- 2 *General Health*
- 3 *Special Conditions*
- 4 *Controversies/Relationships*

- 5 *Best Sources*
- 6 *Foods*
- 7 *Supplements*
- 8 *Menus/Recipes*

- 9 *Recommendations*
- 10 *General Health*
- 11 *Special Conditions*
- 12 *Safety*
- 13 *Limited interest in topic*

FEEDBACK CODES

- 1 *Help me find/access information to answer my question*
- 2 *Adjust presentation of information to increase usefulness*
- 3 *Request additional information to enhance site usefulness*
- 4 *Affirm site/information is useful to me as a dietitian in my work*
- 5 *Limited interest in topic*

LEVELS OF QUESTION/COMMENT COMPLEXITY CODES

- 1 *One idea or search term per text chunk*
- 2 *two ideas or search terms per text chunk*
- 3 *three or more ideas or search terms per text chunk*

Appendix G

Mixed Methods Research Data Analysis Findings

Mixed Methods Research Data Analysis Findings

Summary of Key Findings

- Learnomega3rd Website is an effective online tool for answering Nebraska registered dietitians omega-3 fatty acids questions
- Topic specific websites are able to provide access links to evidenced based websites, journal articles, and educational resources which meet the learning needs of registered dietitians in Nebraska
- Google Site services are designed for group dialogue and information exchange in a safe online environment. This is a free online public service offered by Goggle. These website services were used for this research study with dietitians in their work setting. Study participants were able to access website as a viewer without a password. They were able to access website as a collaborator with dialogue privileges using password provided by the researcher. The researcher maintained Google site ownership privileges during research study.
- Google Site services provide website software formatting which meets current online web coding demands. Website owner is then responsible for adding content, graphics, and desired linkages within predesigned webpage formatting. Owners then invite website audience to view site as public viewers, restricted access viewers, or restricted access collaborators.

Application of Content Analysis Findings to Future Website Design

- Audience specific terminology used when asking omega-3 fatty acids questions can be identified using content analysis. This terminology can be built into key

word search terms, frequently asked questions, and navigational tools. See Table 1 Appendix G.

- Codebook development using content analysis findings allows for measurement of how often omega-3 fatty acids information is requested and used by dietitians. Website content domains which are most relevant to dietitians can then be identified and build into website design.
- Level of question complexity is measureable using findings from content analysis. For example, is the omega-3 fatty acids question simple, containing one concept; or complex containing two or more concepts within the question?
- Website layering decisions can be guided by findings from content analysis
 - Layer One - Frequently asked questions
 - Layer Two - Main subject categories
 - Layer Three - Types of online information linkages available which provide
 - Answers to frequently asked questions
 - Basic information by subject categories

Table 1 Future Website Navigational Guides: Using a Learner-Centered Question-Based Educational Approach

NAVIGATION SIDEBAR HOME PAGE LOCATION – TOP LEFT COLUMN

- *Home*
- *Known Benefits*
- *Best Sources*
- *Recommendations*
- *Current Research*
- *Commonly Asked Questions*
- *Ask the Expert*
- *Site Map*

TABLE OF CONTENTS HOME PAGE LOCATION – CENTER MIDDLE COLUMN

Content Categories

Known Benefits

- *General Health*
- *Special Conditions*
- *Controversies/Relationships*

Best Sources

- *Foods*
- *Supplements*
- *Menus/Recipes*

Recommendations

- *General Health*
- *Special Conditions*
- *Safety*

SEARCH BOX HOME PAGE LOCATION – TOP RIGHT CORNER

Pull down menus:

- ✓ ***Commonly Asked Questions*** (*indexed using table of content category headings*) linking directly to webpage content containing individual question/answer (developed by experts)
- ✓ Commonly used ***Omega-3 terms*** in website content (*glossary terms or tags used in developing website content pages*)

INTEREST CATEGORIES HOME PAGE LOCATION – CENTER RIGHT SIDE TOP BOX

Quick Answers – to Commonly Asked Questions

Current Research Highlights – In the News

Ask the Experts

Consumer Resources

Basics – Review

VISUAL GRAPHICS HOME PAGE LOCATION – CENTER RIGHT SIDE BOTTOM BOX

Picture or Diagram – which represents Omega-3 Topic and draws learner into website information; this can be rotating file of pictures and diagrams to bring life to home page design

SITE BANNER ALL WEB PAGES PLUS HOME LOCATION – CENTER COLUMN ABOVE WEBPAGE CONTENT TEXT BOX

Home Page – displays content categories which can be clicked and leads to specific content developed within that category for viewing

Content Webpage – displays content specific to webpage category tag at top of content box

Commonly Asked Questions/Answers – displays specific question for webpage tag at top of content box and provides text answer to question following

Ask the Expert – provides explanation of how to ask questions of experts which are not provided in content areas already developed or in commonly asked questions/answers provided

OTHER SITE PAGES HOME PAGE LOCATION – TOP/BOTTOM LINKAGE GROUPS

Meet the Experts

About Omega-3 Community of Practice

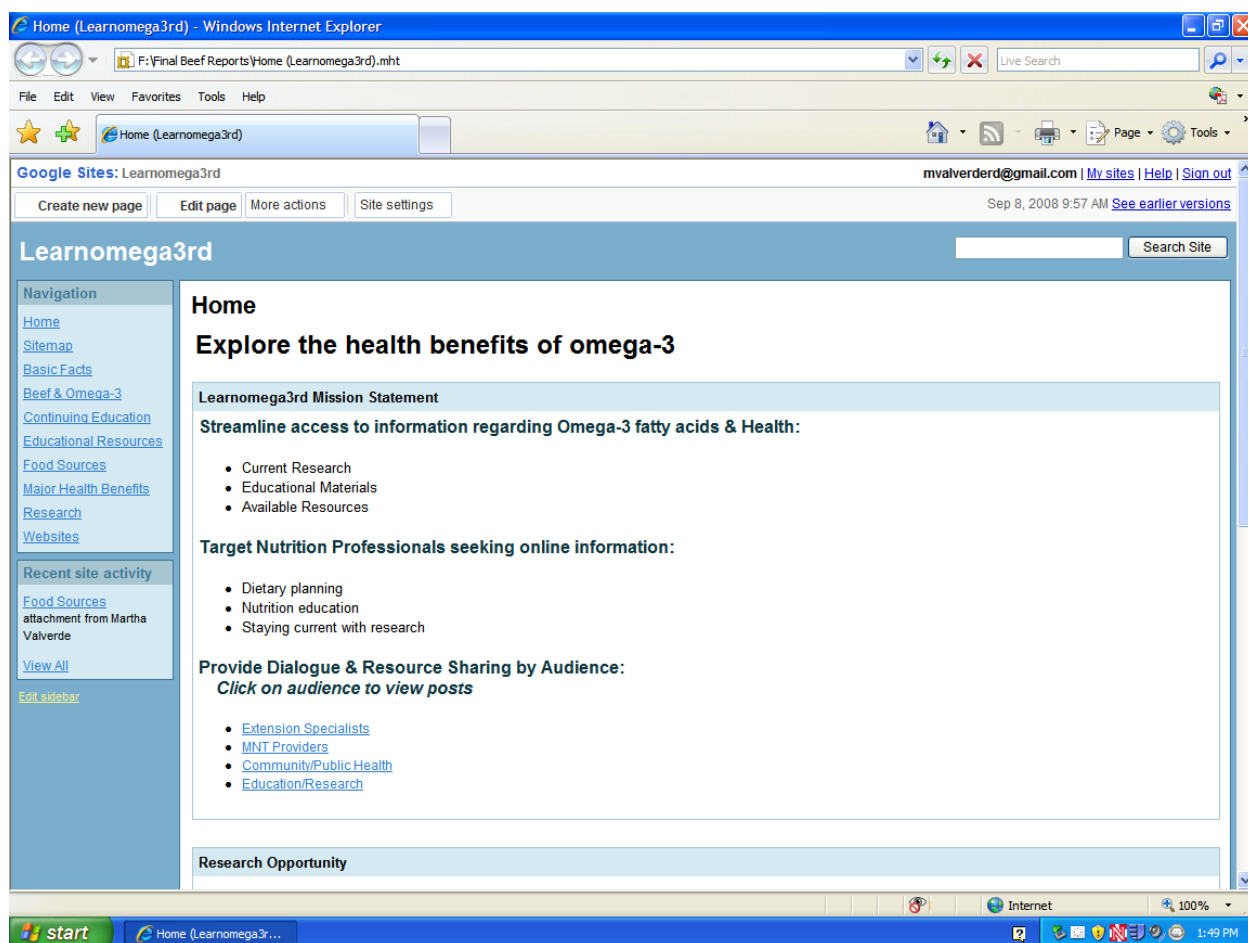
Extension Links to larger community

Appendix H

Learnomega3rd Website Screen Captures

Learnomega3rd Website Screen Captures

Home Page



Research Survey

Participate in Research (Learnomega3rd) - Windows Internet Explorer

http://sites.google.com/site/learnomega3rd/participate-in-research

File Edit View Favorites Tools Help

Participate in Research (Learnomega3rd)

Gmail Calendar Documents Photos Reader Sites Web more ▾

mvalverderd@gmail.com | My sites | Help | Sign out

Google sites Participate in Research

Create page Edit page More actions ▾

Learnomega3rd

Search Site

Recent site activity

[Websites](#)
attachment from bethanymurray

[View All](#)

Navigation

[Table of Contents](#)
[Home](#)
[Known Benefits](#)
[Best Sources](#)
[Recommendations](#)
[Current Research Articles](#)
[Frequently Asked Questions](#)
[Ask the Expert](#)
[Sitemap](#)

[Web version](#)

Participate in Research

How can I get involved?

Website Feedback

- We'd like to know if you were able to find information to answer your omega-3 questions; were the navigational tools helpful?
- Click Website Feedback Survey link: https://www.surveymonkey.com/s.aspx?sm=eVvdlfWObrP_7hTF0aX6LGoQ_3d_3d
- Ways to browse website:** Navigation Bar, Keywords/Site Search, and Site Map

Omega-3 Questions

- We'd like to know your questions about omega-3 fatty acids
- Click Frequently Asked Questions Survey link: https://www.surveymonkey.com/s.aspx?sm=2f33r3naTH1KEWZvAhIVPQ_3d_3d

Thank you!

+ Add file Move to ▾ Delete Subscribe to changes

Survey Links (Remove)

<input type="checkbox"/>	Frequently Asked Questions Survey	Sep 8, 2008 9:32 AM	Martha Valverde
<input type="checkbox"/>	Website Feedback Survey	Sep 8, 2008 9:47 AM	Martha Valverde

start Website Screen Shot... Participate in Researc...

Internet 100% 2:33 PM

Sample Web Page

Current Research Articles (Learnomega3rd) - Windows Internet Explorer

http://sites.google.com/site/learnomega3rd/current-research-articles

File Edit View Favorites Tools Help

Current Research Articles (Learnomega3rd)

Gmail Calendar Documents Photos Reader Sites Web more

mvalverderd@gmail.com | My sites | Help | Sign out

Google sites Current Research Articles

Create page Edit page More actions

Learnomega3rd

Search Site

Recent site activity

Websites
attachment from
bethanymurray

[View All](#)

Navigation

Table of Contents

Home

Known Benefits

Best Sources

Recommendations

Current Research Articles

Frequently Asked Questions

Ask the Expert

Sitemap

[Edit sidebar](#)

Current Research Articles

[Add file](#)
[Move to](#)
[Delete](#)
[Subscribe to changes](#)

Best Sources (Remove)

<input type="checkbox"/>	Comparison of the effects of fish and fish oil capsules on the n 3.pdf	Source	135k	v_3	Nov 18, 2008 9:40 AM	Martha Valverde
<input type="checkbox"/>	Flaxseed oil and fish oil capsule consumption alters human red.pdf	Source	166k	v_3	Nov 18, 2008 9:40 AM	Martha Valverde
<input type="checkbox"/>	Flaxseed oil and fish-oil capsule consumption alters human red.pdf	Source	166k	v_3	Nov 18, 2008 9:40 AM	Martha Valverde
<input type="checkbox"/>	Impact of Peanuts and Tree Nuts on Body.pdf	Source	520k	v_3	Nov 18, 2008 9:40 AM	Martha Valverde
<input type="checkbox"/>	INNOVATIVE DIETARY SOURCES.pdf	Source	270k	v_3	Nov 18, 2008 9:40 AM	Martha Valverde
<input type="checkbox"/>	The Role of Tree Nuts and Peanuts in the.pdf	Source	550k	v_3	Nov 18, 2008 9:40 AM	Martha Valverde

Known Benefits (Remove)

<input type="checkbox"/>	Associations of maternal fish intake during pregnancy and.pdf	Pregnancy	132k	v_3	Nov 18, 2008 9:41 AM	Martha Valverde
<input type="checkbox"/>	Combining fish-oil supplements with regular aerobic exercise.pdf	Benefit	221k	v_3	Nov 18, 2008 9:41 AM	Martha Valverde
<input type="checkbox"/>	Cystic Fibrosis and Nutrition.pdf	Special Condition	329k	v_3	Nov 18, 2008 9:41 AM	Martha Valverde
<input type="checkbox"/>	Docosahexaenoic and arachidonic acid concentrations in human.pdf	Pregnancy	175k	v_3	Nov 18, 2008 9:41 AM	Martha Valverde
<input type="checkbox"/>	Effect of fish-oil supplementation on	Mental Health	167k	v_3	Nov 18, 2008 9:41 AM	Martha Valverde

start Current Research Art... Website Screen Shot... Internet 100% 2:03 PM

Sample Website Link



Sample Recommendation Link

Summary of a workshop on n-3 fatty acids: current status of recommendations and future directions^{1,2}

Sharon R Akabas and Richard J Deckelbaum

The American Journal of Clinical Nutrition

INTRODUCTION

The day after the conference "n-3 Fatty Acids: Recommendations for Therapeutics and Prevention," a workshop was held at the Institute of Human Nutrition, Columbia University, New York, NY (22 May 2005). Present at the workshop were Sharon R Akabas, Jan Breslow, Yvon Carpentier, Richard J Deckelbaum, Esther Granot, Joseph Hibbeln, Craig Jensen, and Penny Kris-Etherton. Susan Carlson and Philip Calder submitted their summaries before the workshop but were not in attendance. All participants had been briefed before the workshop and apprised of the workshop goals and objectives. The workshop objectives were to consider and summarize the strength of the data on positive (or negative) effects of n-3 fatty acids as follows:

- 1) To assess which single n-3 fatty acids [α -linolenic acid (ALA), eicosapentaenoic acid (EPA), or docosahexaenoic acid (DHA)] or combinations might be responsible for specific biological effects in different areas of health and disease.
- 2) Where the data, studies, and consensus permit, to either corroborate or set a recommendation for specific intakes of n-3 fatty acids for each topic reviewed.
- 3) Wherever possible, to distinguish between prevention and treatment of the condition when making recommendations.
- 4) Where the data are insufficient or too disparate to permit setting a recommendation, to identify in general terms the studies needed for such recommendations to be set.

Each participant was supplied a grid for organizing and summarizing data on specific n-3 fatty acids; for pregnancy and infant development, we added arachidonic acid (AA). A sample empty grid is shown in Figure 1.

The workshop participants concluded that most work to date has not sufficiently distinguished between the specific n-3 fatty acids.

Gaps and recommendations for research and policy

- More work should be done to assess whether these doses are associated with any increased bleeding.
- More extensive dose-response studies should be conducted.
- Further assessment of specific effects of DHA and EPA should be conducted on neuropsychological function, immune response, and rates of infection in the infant.

INFANTS

Current knowledge for which a general consensus exists

- High intake ratios of EPA to DHA can lead to a decreased growth rate.
- Current levels of DHA:AA (1.4:1 to 2:1) are beneficial for the visual and cognitive development of low-birth-weight infants and likely also normal-birth-weight infants.

Gaps and recommendations for research and policy

- The role of ALA is poorly understood and should be further examined, but ALA likely cannot substitute for DHA.
- Dose responses of AA and DHA need to be more fully characterized.
- Whether DHA is beneficial for immune and allergic response in older infants should be examined.

CARDIOVASCULAR DISEASE

Current knowledge for which a general consensus on EPA and DHA exists

- Reduced overall mortality after onset of cardiovascular disease.

Downloaded from www.ajcn.org at Univ of Nebraska on July 15, 2009

PDF version of:
Akabas and Deckelbaum 83 (6): S1536. (2006)

[Full Text \(HTML\)](#)

[An erratum has been published](#)

[Purchase Article](#)

[View Shopping Cart](#)

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Citing Articles

[Citing Articles via Google Scholar](#)

Google Scholar

[Articles by Akabas, S. R](#)

[Articles by Deckelbaum, R. J](#)

[Search for Related Content](#)

PubMed

Sample Consumer Handout

http://2026881771303643401-a-1802744773732722657-s-sites.googlegroups.com/site/learnomega3rd/ed - Windows Internet Explorer

http://2026881771303643401-a-1802744773732722657-s-sites.googlegroups.com/site/learnomega3rd/educational-materials/%5B2%5D_Fact_Sh

File Edit Go To Favorites Help

http://2026881771303643401-a-1802744773732722...

52.5%

Sign Find

Pages

Options

1

2

3

blood flow, heart rhythm and healthy skin.

Omega-3 fats can help to prevent heart attacks, sudden cardiac death and certain types of stroke by decreasing blood clots, erratic heart rhythm, inflammation and triglycerides, while raising HDL, or "good" cholesterol. Scientists also are excited about the anti-inflammatory properties of omega-3 fats that might lead to treatments for cancer and autoimmune disorders such as rheumatoid arthritis and lupus (1).

Intake Recommendations

Recommended intakes for omega-3 were set by the Food and Nutrition Board, Institute of Medicine, National Academy of Medicine in 2002/2005.

Children 1-3 years 0.7-0.9 grams/day 4-18 years 1.0-1.6 grams/day

Adults 19-70+ years Women 1.1 grams/day; Men 1.6 grams/day

Pregnancy 1.4 grams/day (0.1-0.3 grams/day from a good DHA source) (2)

Lactation 1.3 grams/day

References: 1. Kennedy, S. It's a Good Thing -- Omega-3 Fats. Amino IntelHealth: Harvard Medical School's Consumer Health Information. Accessed from: <http://www.intelhealth.com>. 2. American Journal of Clinical Nutrition 2004; 82 supplement: 1524S-85S

Source: Food Nutrient Values for sample menus and common food sources were obtained from USDA Nutrient Database at: <http://www.ars.usda.gov/nutrientdata>

Omega-3 Fact Sheet--Consumers Page 2

Sample Omega-3 Rich Menu

Breakfast	Serving Portion	Grams/Omega-3
Oatmeal, topped with	1/2 cup, uncooked	0.05
English walnuts &	1/2 ounce or 2 Tablespoons	1.29
Toast,	1 slice or 1 ounce white bread	0.04
Margarine	1 teaspoon, 70% vegetable oil spread	0.02

Done

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Sample Fortified Foods Link

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INNOVATIVE DIETARY SOURCES OF N-3 FATTY ACIDS

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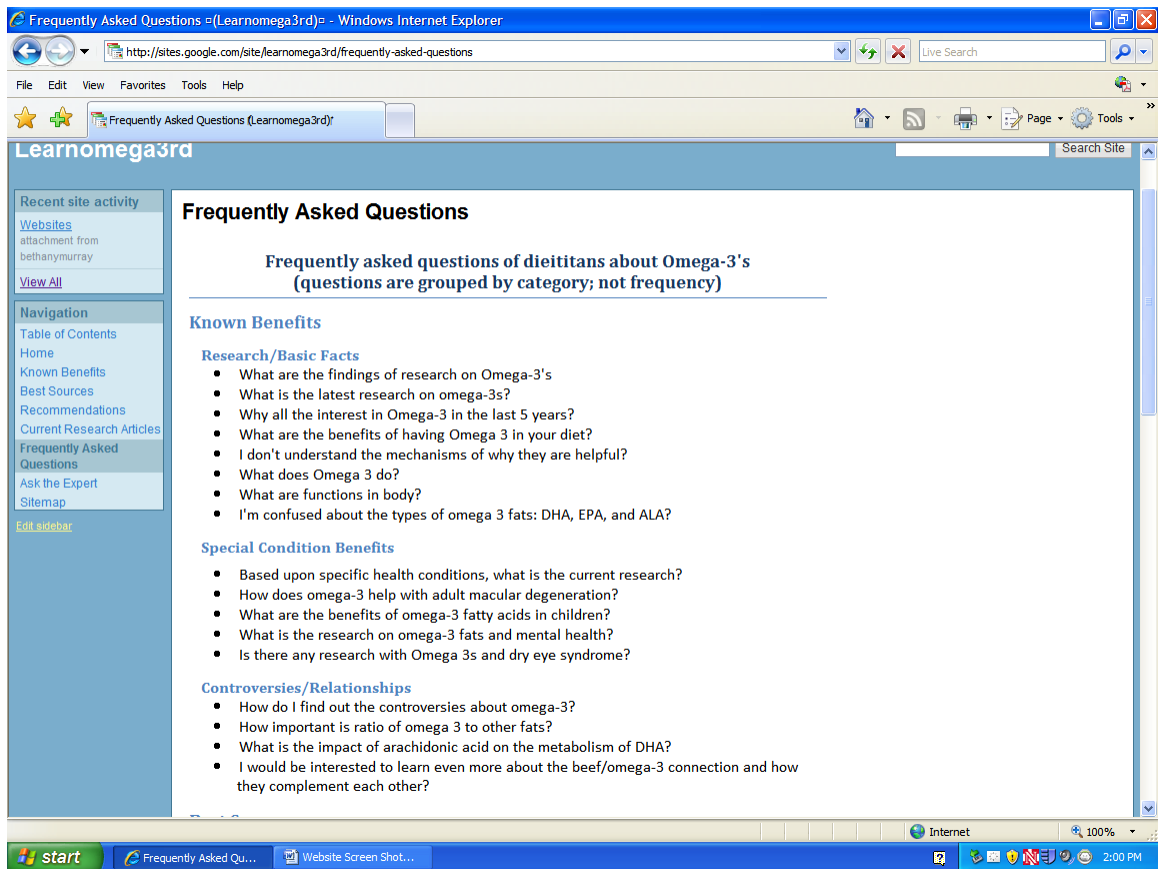
Key Words n-3 PUFA, DHA, fish oil, EPA, α -linolenic acid

Abstract It is now established that dietary n-3 polyunsaturated fatty acids (PUFAs) are involved in health promotion and disease prevention, particularly those tradition-

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Adding Questions to Web Design



Adding Table of Contents to Web Design

