

CHAPTER 2

EVALUATING NUTRITION INFORMATION

OVERVIEW

Chapter 2 focuses on the generation and dissemination of nutrition knowledge. The scientific method is presented as the basis for nutrition research, and different research methods are discussed. Various sources of nutrition information are evaluated, including peer-reviewed scientific journals, popular media, the Internet, and registered dietitians. The chapter places a strong emphasis on the importance of being a critical and educated consumer of nutrition information. The *Chapter 2 Highlight* provides information on dietary supplements and complementary and alternative medicines.

CHAPTER OUTLINE

- I. Understanding the Scientific Method
 - A. Introduction
 1. Recommendations based on conventional beliefs, traditions, or anecdotes are rejected when they are no longer supported by scientific evidence
 2. The scientific method is used to conduct research
 - a. Make observations
 - b. Formulate hypotheses
 - c. Design studies, perform tests, collect data
 - d. Analyze data, draw conclusions
 - e. Report findings
 - f. Repeat research to confirm or refute previous findings
 - g.
 - B. Laboratory Experiments
 1. An experiment is a systematic way of testing a hypothesis
 - a. In vivo experiments use whole living organisms
 - b. In vitro experiments use cells or other components derived from living organisms
 2. The scientific method illustrated in Fig. 2.2 is followed in lab experiments
 3. Experiments usually involve two groups: treatment and control; this allows the researcher to determine the impact of the treatment
 4. Researchers must be careful when applying the results of animal or in vitro studies to people due to physiological differences
 - C. Human Research: Epidemiological studies
 1. Introduction
 - a. Epidemiology is the study of disease rates among different population groups, factors associated with the occurrence of diseases, and how diseases spread in a population
 - b. Data for epidemiological studies may be obtained by physical examinations or surveys
 2. Experimental (Intervention) Epidemiological Studies
 - a. These studies are conducted in order to gain information about the effect of specific dietary practices on health conditions.
 - b. A two group design is generally used: treatment and control.
 - c. Control group participants receive a placebo.

- i. The placebo effect occurs when someone reports a positive or negative effect of the treatment when they have in fact received a “fake treatment”
 - ii. Placebos can produce beneficial physiological or psychological effects
- 3. Observational Epidemiological Studies
 - a. Case-control
 - i. Individuals with a health condition are matched to similar persons who do not have the condition
 - ii. Detailed information is collected on both groups of participants and factors associated with the health condition are identified
 - b. Cohort
 - i. Information is collected on a large group of people over time
 - ii. Cohort studies can be retrospective or prospective
 - iii. Scientist use these types of studies to identify links between exposures and disease occurrence
 - iv. The Framingham Study is one of the best known prospective cohort studies
- 4. Limitations of epidemiological studies
 - a. Epidemiological studies can suggest hypotheses, but cannot establish causation
 - b. A correlation is a relationship between variables; two variables change together over the same period of time
 - i. Direct (positive) correlation: two variables change in the same direction
 - ii. Inverse (negative) correlation: two variables change in opposite directions
 - c. Correlations may be by mere chance
- D. Elements of an Experimental Epidemiological Study
 - 1. Introduction
 - a. Research involving human subjects involves these basic steps
 - i. Reviewing the scientific literature
 - ii. Developing a hypothesis
 - iii. Designing the study
 - iv. Conducting the research
 - v. Analyzing the results
 - vi. Reporting the results
 - vii. Conducting further research
 - b. The goal of human epidemiological studies is to learn about the influence of diet on health
 - 2. Reviewing the scientific literature
 - a. Search the scientific literature for previous research articles on the topic of interest
 - b. Findings of previous studies may raise questions for further exploration
 - 3. Developing a hypothesis; informed guess about the relationship between the variables under study
 - 4. Designing the Study
 - a. Studies are usually designed such that participants can continue to live their normal lifestyle due to cost and ethical concerns
 - b. Subjects are randomly assigned to the treatment or control groups
 - c. Double-blind Studies
 - i. Studies are usually double-blind; neither the researcher or the participant is aware of group assignment
 - ii. This procedure is necessary in order to preserve the integrity of the study

- d. Reviewing Human Subjects Research Designs
 - i. U.S. federal guidelines must be followed in human subjects research
 - ii. All research must be approved by the institution's human subjects review committee prior to implementation
 - 5. Conducting Human Research
 - a. Large numbers of participants are generally recruited
 - b. Both groups are given a treatment, either real or placebo
 - 6. Analyzing Data, Drawing Conclusions, and Reporting Findings
 - a. Statistical methods are used to test relationships between the variables under study
 - b. Researchers summarize and seek to publish findings
 - c. During peer review, investigators who were not part of the study critically analyze the research design, conduct of the study, and fair representation of results
 - d. Research bias may occur when the scientists or their funding agencies have expectations about the outcome of the research; authors are often required to disclose their affiliations and financial support to help readers interpret the reliability of the findings
 - 7. Spreading the News
 - a. Media (e.g., newspapers, television, popular magazines, Internet) may sensationalize or oversimplify scientific findings
 - b. Nutrition information reported by the media may be faulty or biased, as it is generally not subject to peer review
 - c. Popular (non-peer reviewed) magazines generally have colorful, attractive covers with short, easy-to-read articles
 - 8. Following up with More Research
 - a. The findings generated by one research team must be supported by other studies before gaining widespread acceptance
 - E. Confusion and Conflict
 - 1. Confusion, discouragement, and mistrust among the public may result from the conflicting scientific evidence reported by the media
 - 2. Conflicting findings arise from differences in study design, subject characteristics, assessment methods, and statistical analysis
 - 3. The science of nutrition is constantly evolving; change is to be expected
- II. Nutrition Information: Fact or Fiction
- A. Introduction
 - 1. A testimonial is a personal endorsement of a product; endorsers are usually paid for the testimonial
 - 2. Anecdotal experience is not the same as scientific evidence
 - B. Be skeptical of claims
 - 1. It is prudent to be skeptical about nutrition information until you have investigated the credibility of its sources
 - 2. The U.S. Constitution guarantees freedom of press and freedom of speech, but does not protect the public against misinformation
 - 3. The U.S. Food and Drug Administration regulates health claims on supplement labels, but does not regulate information contained in pamphlets, books, or websites
 - 4. Promoters of supplements/diets may employ pseudoscience

- a. Citing scientific studies to support their claims, whereas these studies may not be credible or may not be representative of all data (i.e., may not include contradictory findings)
 - b. Using complex, scientific-sounding terms
 - 5. Nutrition misinformation capitalizes upon the public's mistrust of the scientific and medical community; scare tactics fuel this mistrust
 - 6. The decision-making responsibility lies with the consumer; it is prudent to seek opinions of a medical professional
- C. Ask questions
 - 1. What motivates the authors, promoters, or sponsors to provide the information? Do you think they are more interested in your health and well-being or selling their products?
 - 2. Is the research source from a peer-reviewed journal?
 - 3. If a study is cited, how was the research conducted? Did the study involve humans or animals? If people participated in the study, how many subjects were involved in the research? Who sponsored the study?
 - 4. To provide scientific support for claims, does the source cite respected nutrition or medical journals or mention reliable experts?
 - a. Providing nutrition information and advice without proper training and licensing is illegal
 - b. Quackery promotes useless medical treatments; see www.quackwatch.org
- D. Look for red flags
 - 1. Promises of quick and easy remedies for health-related problems
 - 2. Claims that sound too good to be true
 - 3. Scare tactics
 - 4. Attacks on conventional scientists and health care practitioners
 - 5. Statements about the superiority of natural dietary supplements and unconventional medical practices
 - 6. Testimonials and anecdotes
 - 7. Information that promotes a product's benefits while overlooking its risks
 - 8. Vague, meaningless, or scientific-sounding terms
 - 9. Sensational statements without citing complete references of sources
 - 10. Recommendations based on a single study
 - 11. Information concerning nutrients or human physiology that is not supported by reliable scientific evidence
 - 12. Dramatic generalizations
 - 13. Results disclaimers in small difficult to read print
- E. Using the Internet wisely
 - 1. Investigate the credibility of the source or sponsor
 - 2. Be wary of the objectivity of information found on sites designed to sell a specific product
 - 3. Look for disclaimers
 - 4. Sites sponsored by nationally recognized health associations, non-profit organizations, government agencies, or academic institutions generally present reliable information
 - 5. Federal Trade Commission enforces consumer protection laws that relate to health information presented on the Internet
 - 6. Table 2.1 presents tips for searching nutrition information on the Internet

III. Reliable Nutrition Experts

A. Introduction

1. There is no standard legal definition for the term “nutritionist”
2. A registered dietitian is a college-trained expert in nutrition

B. Becoming a Registered Dietitian

1. There are three major divisions of dietetics
 - a. Clinical dietetics
 - b. Community nutrition
 - c. Food service systems management
2. An R. D. has completed a BS degree in an accredited school
3. Courses for dietetics students include food and nutrition, chemistry, biology, physiology, food service systems management, business, and communications
4. Students can go through two pathways to become a dietitian
 - a. Coordinated program
 - b. Didactic Program
5. After completing a dietetics program and internship students are eligible to take a national certification exam to become an RD
6. RDs must continually update their knowledge by obtaining continuing education credits

IV. Chapter 2 Highlight –What are Dietary Supplements?

A. Introduction

1. 20-50% of U.S. adults report taking dietary supplements
2. The DSEA defines a dietary supplement as a product that adds to a person’s intake and contains one or more dietary ingredients; is taken by mouth; and is not promoted as a conventional food
3. Dietary supplements include nutrient pills, protein powders, herbal supplements, and energy drinks and bars
4. Table 2.2 provides information on popular supplements

B. What is Complementary and Alternative Medicine?

1. CAM includes a variety of health care practices and products not accepted by conventional health care providers
2. CAM includes chiropractics, homeopathy, naturopathy, and massage therapy
3. There is little evidence to support the efficacy of most nonnutrient dietary supplements
4. NCCAM, a part of NIH, funds research on alternative medicine

C. How are Dietary Supplements Regulated?

1. The FDA is responsible for the safety and efficacy of medications and other health-related products.
2. The FDA regulates dietary supplements as foods, not drugs.
3. Most of the strict FDA regulations do not apply to supplement manufacturers
4. If the FDA determines that a supplement poses a risk to consumers then an alert and recall of the product is initiated

D. Using Dietary Supplements Wisely

1. Some herbal supplements are made from plants that have toxic parts
2. Some herbal supplements may induce an allergic reaction
3. Herbal supplements may interact with prescription or OTC medications
4. Precautions should be taken with all dietary supplements

5. A physician should be contacted if negative side effects are experienced and the problem should be reported to FDA's MedWatch program

V. HELPFUL TEACHING IDEAS

1. Ask students to select, review, and bring in a nutrition research article from a peer-reviewed journal. Have students briefly summarize the research topic, research question(s), methods used to explore the research questions, results, and potential applications to the practice of dietetics.
2. In small groups, have students select a research question that interests them. Ask the students to outline a research study to address the research question. Be sure that students are able to identify a hypothesis, select an appropriate study design, and identify the strengths and limitations of their own study design.
3. Ask students to find a website that offers nutrition information. Have students summarize the information, identify the source of the information, evaluate the potential for bias, and locate any disclaimers given on the site. Based on this information, ask students to evaluate the reliability of the information presented on the website.
4. Present a recording of a nutrition-related infomercial to the class. Have students identify any of the red flags presented on pages 46-47.
5. Connect students or groups of students with registered dietitians for a brief interview. Ideally, the RDs should be employed in a variety of settings, including clinical dietetics, community nutrition, food service systems management, academics, and research. Students should ask the RDs about their motivation to pursue dietetics, educational background, the path their careers have taken, their likes and dislikes about the profession, and their future career plans.
6. Have students research a dietary supplement or complementary or alternative medicinal practice of interest to them in order to understand the volume of research on the topic and the efficacy of the supplement or treatment. Short class presentations on the information would be beneficial to all.

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