

Communicating Effectively with Pregnant Adolescents Who Have Limited Literacy or Comprehension Skills

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Adolescence is a time of change, physically, emotionally and cognitively. The body evolves from that of a child into that of a young adult. Reproductive capability is realized. Adolescents become more independent of their parents and siblings. As they grow in age and experience, their understanding of the world around them grows as well. The ability of the adolescent to understand and comprehend complex thoughts, actions and situations increases dramatically as the adolescent continues to undergo new experiences and absorb more knowledge. When the adolescent becomes pregnant, the ability to utilize abstract reasoning becomes vital as she moves from the role of dependent child into that of independent adult and parent.

The development of increasingly sophisticated reasoning abilities is not consistent among adolescents. Many factors contribute to the ability of an adolescent to comprehend complex information and situations. Among these factors are the ability to read (literacy), the ability to understand and manipulate numbers (numerical skills), and the ability to incorporate information into an understandable framework which has meaning to the adolescent (comprehension).

- Many young adolescents have not been exposed to sufficient years of education to develop higher level literacy and numerical skills.
- They also draw upon limited life experiences, which limits their comprehension abilities.
- Older adolescents may also lack the skills of literacy, numerical ability and abstract reasoning when education and life experiences have been limited or when English is a second language.

Nutrition concepts may seem relatively simple and straightforward to adult health care professionals but they are often very confusing to educated, literate adults. Imagine how they must seem to a young pregnant adolescent with limited numerical, literacy and comprehension skills! Therefore it is imperative that health care professionals become proficient in identifying adolescents who have limited skills in these areas.

Health care practitioners should assess each client's needs, abilities and preferences for learning, and provide health education in a manner that she can comprehend.

Providing easily understandable health education for adolescents who have limited literacy skills or language

barriers may seem like a monumental task. There are, however, some basic skills that health care practitioners can develop to make this process easier.

- Learn to identify the skills the pregnant adolescent may lack.
- Determine what methods of teaching are most appropriate given the skills of the individual adolescent.
- Determine the effectiveness of the education provided.

This chapter will provide a brief overview of these steps as they relate to pregnancy and nutrition education.

IDENTIFYING ADOLESCENTS WITH LIMITED LITERACY AND COMPREHENSION SKILLS

Adolescents with limited literacy, numerical and comprehension skills are not visibly different from adolescents with higher level skills. It is often not possible to determine literacy or comprehension skills even during a lengthy conversation. Many may believe that limited literacy and comprehension skills are a problem faced mainly by those working in inner city clinics or facilities that serve large numbers of minority or immigrant populations. Yet low literacy skills pervade all levels of society, even when English is the primary language.

- Reading skills of patients seen in public medical settings whose primary language is English have been shown to be three to five grades below the highest completed grade of school.¹
- Clients seen in private health care clinics have been found to read two to three grades below their highest level of education.²
- Approximately one in four Americans over the age of 16 cannot read beyond the 8th grade level.³
- Twice as many cannot comprehend complex concepts in written materials.³
- So how do we identify limited literacy or comprehension skills in adolescents? One simple way is by increasing our awareness of common behaviors that can signal inabilities. Table 1 lists some of the common signs that can signal that an individual has limited literacy or comprehension skills.⁴

TABLE 1
Common Signs of Low Literacy or Comprehension Skills

Typically, individuals with low literacy or comprehension skills:

- have a record of poor school attendance and/or performance
- do not completely fill out medical or dietary assessments
- request to take forms or materials home to complete
- are unwilling to read or sign a form without discussing the content with a friend/partner/family member
- have handwriting that looks immature
- write very slowly
- say they forgot (or broke) their glasses and cannot read without them
- ask basic questions about information that is clearly contained in written literature
- refer to foods only by color, name brand or logo (i.e., yellow milk for lowfat milk)
- complain of a headache (or other health problem) too severe to allow them to read
- are less than 16 years old

Nutrition education materials often involve complex concepts that require abstract thinking ability for full comprehension. Many adolescents, particularly those who are very young, may not have developed the types of reasoning abilities or literacy skills needed to read and understand nutrition education materials, such as a booklet outlining the basic requirements of a diabetic diet. Therefore, it is up to health care providers to identify adolescents who may have difficulty comprehending existing nutrition education materials and to adjust the reading and comprehension level of existing materials to a level that the pregnant adolescent can understand. A description of tests that are used by education and health professionals is provided below.

Literacy Tests

Literacy tests are reading tests that measure word recognition and pronunciation skills in clients by having the client read from a list of printed words. When the client is unable to continue or commits a designated number of reading errors, the reading level can be calculated.

- Two of the most widely used literacy tests appropriate for use in medical settings are the Wide Range Achievement Test (WRAT) and the Rapid Estimate of Adult Literacy in Medicine (REALM) test.
- There are other reading tests that measure literacy skills, such as the Slosson Oral Reading Test (SORT) and the Peabody Individual Achievement Test-Revised (PIAT-R). These tests are not considered to be as useful in the medical setting, however, because they are longer tests and are more difficult to administer.

Comprehension Tests

Comprehension tests measure how much meaning an individual confers from reading a sentence or text.

- Comprehension tests can be administered verbally or in written form.
- Written comprehension tests, such as the Cloze method, utilize a sentence completion technique in which every *n*th (usually 5th) word is left out and a blank is inserted in its place. Clients are asked to complete the sentence with a word from a pre-determined list. Their ability to complete the sentence correctly determines their comprehension score.
- If the adolescent's reading skills have tested below the 6th grade level it is recommended that the comprehension test be given orally. This is done by reading a short set of key points to a client (the text should read at or below a 5th grade level). The client is then asked several questions about the information they were read.

Combined Literacy and Comprehension Tests

The Test of Functional Health Literacy in Adults (TOFHLA) has been developed as a combined measure of reading and comprehension skills.

- The TOFHLA can assess a client's ability to perform health-related tasks such as taking medications or completing a medical consent form.
- As with other tests appropriate for a medical setting, it is simple to administer and requires little time.

ASSESSING THE READING LEVEL OF PRINTED MATERIALS

Readability formulas have been developed to determine the approximate reading level of printed materials. There are many formulas that can be used to determine the reading level of printed text in educational pamphlets.

- Most word processing programs are capable of determining readability scores and grade level of text within their grammar and spell check tools. The results will be given as Flesch, Fry, FOG or SMOG scores, along with the corresponding reading grade level of the text.
- The disadvantage of using a word processing program, however, is that text must be entered or scanned into the word processing program in order to have the reading level assessed. This limits the use of such programs on existing health education materials.
- One of the simplest methods to use is the Fry formula,⁵ a commonly used test that is not copyrighted. It is used to assess printed materials that have already been developed by looking at the number of words and sentences used and the number of syllables included in the text. Most health education materials can be assessed using the Fry method in less than one hour.

DEVELOPING OR REVISING NUTRITION EDUCATION MATERIALS

It is important to remember that individuals with limited literacy and comprehension skills read and comprehend *differently* than do individuals with higher level skills.

- Because they often lack the ability to interpret information in an abstract manner, people with limited literacy and comprehension skills comprehend only the literal meanings of words and phrases.

- They may not understand the implied meanings in health care messages. Messages must be clearly and concisely stated.
- Individuals with low comprehension skills often cannot relate information contained in an educational material to themselves. Information contained in nutrition education materials must therefore relate to basic daily needs and tasks, such as cooking and eating, and must be presented in the most concrete manner possible. An example that relates the health message to their daily life is more likely to be understood and remembered than a message that consists only of medical facts.
- Nutrition education materials should be written at the 5th grade reading level or below.
- Most health education materials available read at approximately the 10th grade level.
- A common mistake found in many health education materials is the length of sentences and paragraphs. As educated health professionals we are used to reading long passages of information that require us to classify or categorize concepts as we read. Many adolescents have not yet developed the ability to classify health information into meaningful categories.
- Individuals with lower literacy abilities read and comprehend information slowly. By the time they come to the end of a long paragraph made up of complex words they have spent so much time and energy in recognizing and reading the words that they have not had time or energy to comprehend the meaning of the sentences. In summary, as you increase the complexity of your text you decrease the likelihood that your clients will remember the information.
- By using short, simple words, sentences and paragraphs we can make our message much easier to read and comprehend.
- Use short sentences. Sentences should be no more than 20 words (fewer is better). Use punctuation to separate out important concepts.
- Paragraphs can look intimidating if they are long. Try to write paragraphs with fewer than four sentences.
- Keep the health education material focused on five or fewer key points. Our capacity to learn and remember information is limited even when we are highly literate and have well-developed abstract thinking skills. This inability to absorb infinite amounts of information is even more pronounced in individuals with limited comprehension skills.
- Avoid technical terms and medical jargon. If you must use a technical term, define it in parentheses. For example, "Hypertension (high blood pressure) is easily treated."
- Provide many examples to illustrate your point. For example, "Foods that are high in folic acid include spinach, dry beans, orange juice and breakfast cereals."
- Use a large font that is easily readable. 12 or 14 pt. Times Roman is easily read by most low literacy individuals.
- Most people with limited comprehension skills have a very limited vocabulary so try to choose common words. You may find yourself repeating words or phrases over and over, but that is what makes sentences easier to read and comprehend.
- Write in a manner that makes the message personal. Instead of saying "A diet high in solid fats can cause people to have high cholesterol levels" try writing "If you eat many solid fats, such as butter or shortening, it can cause your cholesterol to become high."
- Develop a list of word substitutions for your own use and circulate that list to colleagues. Use these word substitutions in your verbal and written communication with adolescents who have low literacy and comprehension skills or who have learning disabilities.
- Do not write words in all capital letters. It is more difficult to read words in all capital letters than it is to read small caps or a variety of caps because it is harder to distinguish between individual letters. Use differences in font size or color to distinguish important concepts rather than capital letters.

GUIDELINES FOR DEVELOPING PRINTED MATERIALS

Writing Style

- Write your materials at a 5th grade reading level. You can check the reading level of text in most word processing programs in the spelling and grammar checking tools.

Organization

- Put the most important points at the beginning of each paragraph and at the beginning of the document. If adolescents have poor reading skills they may not read the entire paragraph or pamphlet to get to the main message.
- Highlight, bold or write important concepts in another color to distinguish them from less important concepts. Underlining makes them stand out but the added “busyness” can interfere with the ability to read words.
- Leave plenty of white space between paragraphs and sections of your document. If you have edited your handout so that it reads at a 5th grade level you will probably have eliminated much of the text. White space makes a handout more inviting to read and allows the reader to more easily distinguish important points.

Graphics and Illustrations

- Use as many pictures and illustrations as needed to demonstrate all desired actions by the clients. Each important concept in a patient education material should have an illustration to demonstrate it. Illustrations can be simple pencil-line drawings, actual photographs, or computer-generated images.
- Use pictures and illustrations on food frequency tools where the inability to read the food items listed can render this method of dietary assessment difficult for the low literacy adolescent. Figure 1 provides an example of a food frequency form modified for use by individuals with low literacy.
- Illustrations or pictures of full-sized food items in common serving sizes can aid the nutritionist in getting a more accurate estimate of food intake when using food frequency or 24-hour recall methods of dietary assessment.

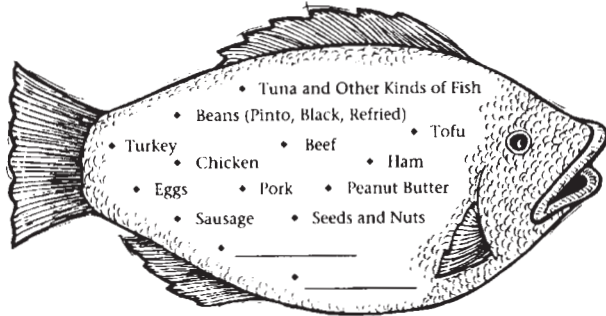
Guidelines for Evaluation and Revision

- Leave space at the beginning or end of each educational material for the client’s name and for the client to take notes. This helps to personalize the material and increases the likelihood that she will keep the pamphlet or booklet.
- When developing a food frequency or medical history questionnaire limit the number of types of question formats to one or two methods. Individuals with low literacy, numerical and comprehension skills are likely to become confused if they are expected to circle foods items from a designated list, list food items that were eaten but are not contained in the list, and to shade in a box listing the size or number of the portions eaten.
- Develop interactive educational materials such as worksheets with blanks to be filled in or food frequencies with checklists of foods. These methods actively involve the adolescent in the education process and help to personalize the educational material for each client.
- Use brand names or colors to identify food products when providing written diet instructions; an adolescent with poor numerical or literacy skills may not know how to choose low-fat milk but can distinguish a milk jug with a red cap over another with a blue cap.
- When translating written materials into a foreign language, always have a person whose native language is that foreign language translate the materials back into English. Many important concepts are lost when translated and may not be apparent to non-native readers of that language. A native speaker should also be able to tell you if there are any culturally sensitive phrases or concepts that should be omitted or revised.
- Involve members of your target population in the development or revision of education materials. Not only can they provide valuable information on language and content, they can also provide some highly creative ideas for delivery methods. At the very least, pilot test all education materials with members of your target audience for language, tone, and cultural appropriateness. It is very important that any people contained in the illustrations are age and culturally appropriate for your target audience.

Figure 1

Eat Enough of These Foods Everyday

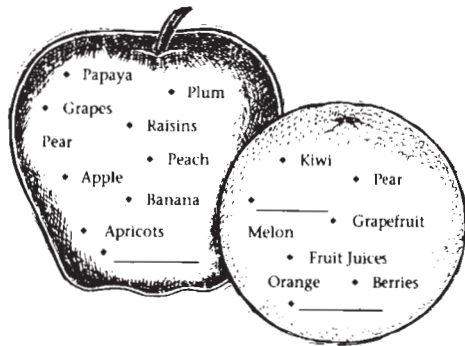
Your baby depends on you to make good food choices.
When you eat well, you feel better and your baby is healthier.



Meat and Protein Foods

Do you eat 3 of these foods everyday?

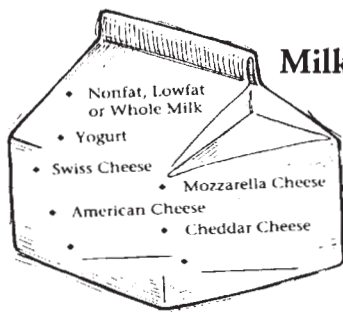
Yes No



Fruits

Do you eat 2 to 4 of these foods everyday?

Yes No



Milk and Milk Products

Do you eat 3 to 4 of these foods everyday?

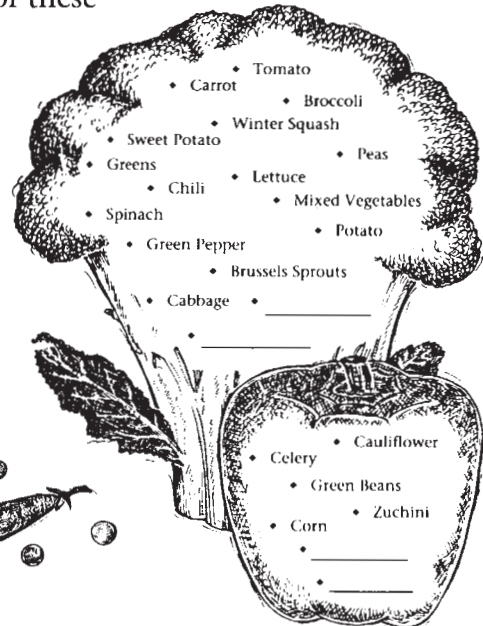
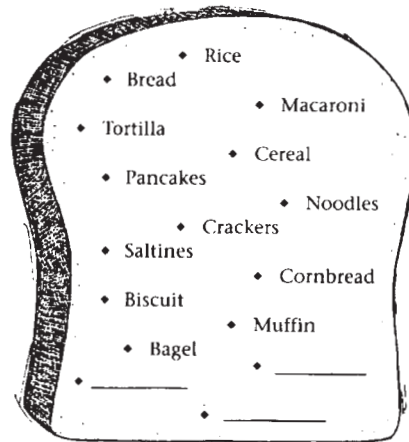
Yes No

If you need more servings from any group, which foods will you add?

Bread and Cereals

Do you eat 7 to 11 of these foods everyday?

Yes No



Vegetables

Do you eat 3 to 5 of these foods everyday?

Yes No

NON-PRINT METHODS OF NUTRITION EDUCATION

Alternative methods of nutrition education can and should be employed with pregnant adolescents who have difficulties in reading or comprehending written English. It is important to remember that listening and observing are our earliest methods of receiving instruction.⁶ These abilities continue to provide the majority of instruction for individuals with limited literacy, numerical and comprehension skills. Listed below are some alternative methods for nutrition education that rely upon listening and observing, including important points to consider when choosing between methods.

Audiotapes

- Instructions and messages given to a patient do not have to be remembered. She can replay the audiotape any time she has a question or forgets the health care message.
- Any health education pamphlet can be turned into an audiotape by choosing 2-5 of the most important concepts in the handout and writing a dialogue about them. For instance, a pamphlet on breastfeeding could be made into an audiotape by having the important concepts be told as a conversation between two expectant mothers or between a health care provider and a patient.
- Taped messages should be clear and concise just like printed messages. It is best to keep taped instructions to less than five minutes in length.
- Information needs to be presented in short, simple sentences made up of common everyday words.
- Taped messages that emphasize desired behaviors are more effective than messages which attempt to educate a teen about a health condition. The message must be relevant to their daily lives to be comprehended and adopted.
- Some tapes utilize a question and answer format, not unlike the format used with audiotapes designed to teach a foreign language. A question is posed to the listener, for example: "Can you name three foods that are high in iron?" This question is followed by a 10-30 second pause so that the listener can think about the information and formulate their answer.

- Audiotapes are easily translated into a foreign language for use by non-English speaking clients.
- Audiotapes are especially effective when used in conjunction with a worksheet, workbook or diet assessment tool rather than when used alone.
- Audiotapes are usually more cost effective and more easily developed than videotapes or computer programs.

Videotapes

- Like printed materials, videotapes should utilize short, simple, concrete messages with no more than 15-20 words per sentence.
- To be easily understood, the comprehension level needs to be at about a 5th or 6th grade level, no higher than an 8th grade level.
- Check any written text for reading level as you would for written materials.
- Narration should be slow enough to allow comprehension of each important concept before moving on to another concept.
- Tapes should be no more than 10 minutes in length. If they must be longer, divide them into several short segments of information with designated breaks.
- Videotapes which demonstrate desired behaviors and instruct clients on how to overcome anticipated barriers to behavior changes are more effective than a videotape which simply educates the client with facts.
- Workbooks, worksheets or dietary assessment tools can be used in conjunction with videotapes to reinforce messages and add interaction.
- It is important that videotapes be age appropriate, culturally relevant and use language that is easily understood by the target audience.
- Videotapes can be developed for non-English speaking clients.
- Videotapes are most effective when they can be viewed privately in a quiet setting, not in a crowded or noisy waiting room where it is hard to hear and comprehend important nutrition messages.

- Methods for distribution of videotapes for viewing can include:
 - having a lending library of tapes for pregnant adolescents
 - designating a small room as a private viewing room for patient videotapes
 - distributing videotapes for free rental through local video stores
- Developing videotapes may be costly but reproduction costs are usually reasonable.
- Many video programs designed for adolescents and low literacy audiences are available for purchase or rental. (See resources.)

Computer Programs

- More interactive than audio- or videotapes.
- Actively engage the user in the education process.
- Provide personal feedback on diet and health to the adolescent.
- Cost of the hardware and software can be prohibitory.
- Limited availability of low literacy programs targeted for adolescents may limit use however simple diet assessment programs can be easily developed by most computer programmers.
- Are more effective when they utilize interactive technologies such as touch-screen commands rather than keystroke commands, which requires a great deal of literacy and numerical skills.
- Assistance must be available if the client needs help with computer programs.

Group Discussion and Educational Activities

- The most highly rated method of nutrition education by individuals with limited literacy skills, including adolescents, is group activities.⁷ Groups should be kept small, four to six people at most.⁷ Group activities:

- Help to hold the participant's interest longer.
- Bring together young adults who may otherwise feel isolated due to their pregnancy.
- Can serve as a nonthreatening way to forge a support network for young mothers.
- Studies show that group discussions led by a health care professional, along with a trained peer educator, are more likely to motivate low literacy clients to adopt health promoting behaviors than are education materials, even when written at an appropriate reading level.
- Skill-building, hands-on activities such as cooking classes and demonstrations are among the most highly desired methods for receiving food and nutrition information.⁷
- Grocery store visits in which clients must purchase foods for their cooking classes provide an excellent way to teach concepts of food selection, price comparison and portion size.
- Games that teach nutrition concepts, such as card games about diabetic diet exchanges, are very effective with young adolescents or individuals with low literacy and numerical skills.
- Simple, short recipes have been cited as being very useful by low literacy populations and serve as incentives to participate in education activities. Recipes should have no more than 10 ingredients in them and should take no more than 20 minutes in time to prepare.
- Other incentives that can attract individuals to group education activities include grocery store coupons, coupons for maternity clothing discounts, and toys or feeding items for their infants.

IMPROVING COMPREHENSION OF VERBAL COUNSELING FOR INDIVIDUALS WITH LIMITED COMPREHENSION SKILLS

Verbal counseling skills can also become more effective when modified to meet the educational needs of adolescents with low literacy skills and English as a second language. Listed below are a few ideas that can increase the effectiveness of your verbal communication.

- When the client has very low comprehension abilities or when English is not their primary language, it is often useful to utilize pictures or realistic drawings of foods when assessing the diet quality or instructing a patient on choosing a healthy prenatal diet. This helps to overcome barriers of having a single food known by several different terms in different languages or cultures.
 - Collages of pictures of foods and beverages are useful tools when non-English speaking people are providing dietary information, however it is important that the collages be made from pictures of foods that are likely to be eaten by individuals of that culture. For example, a collage of foods for use with Hispanic populations would be vastly different from a collage of foods eaten by Hmong adolescents. It is imperative that visual aids be culturally appropriate.
 - When counseling a client with low literacy or numerical skills, it is often useful to use actual food containers or labels. If they can easily recognize a particular food item at a grocery store, they are more likely to purchase and consume that item if they have to search through unfamiliar containers or labels to find a food product.
 - Verbally review the most important points contained in patient education materials when you provide information to the client; even highly literate clients prefer to know which information is “need to know” and which is “nice to know”.
 - Utilize peer educators when possible; this technique can help the pregnant adolescent to “connect” with someone who has gone through a similar experience and can increase the likelihood that she will adopt the strategies suggested by the peer counselor.
 - Utilize interactive methods such as fill in the blank worksheets or checklist food frequencies. These activities are great methods for generating questions by the adolescent.
- they can overcome such barriers, health care professionals increase the likelihood that behavior changes will occur and will be sustained.
- Individuals with low literacy and comprehension skills cite friends and family as a primary source of health and nutrition related information.⁷ Information passed on by friends and family may have little scientific basis and may pose a barrier to behavior changes. In some cases it may even be harmful to the health of the mother or baby. One example is that of a well-meaning aunt who advises her niece not to breastfeed because women in her family have an inadequate milk supply. Another example is that of a well-meaning neighbor who tells a pregnant woman that if she eats a particular type of clay she will improve her chances of having a baby boy.
 - Individuals with low comprehension skills lack the ability to think abstractly and are often not able to develop strategies for overcoming barriers on their own. They should be provided with strategies ahead of time so that they are prepared when the barriers occur.
 - Effective social marketing messages often involve overcoming misinformation or other barriers to adopting health enhancing behaviors by explicitly stating any barriers in the message. This is followed by an explanation of why the behavior should be adopted and a list of practical ways in which to overcome any perceived barriers.
 - Limited literacy and numerical skills can pose barriers when shopping for or preparing food items. Color-coding is a useful technique for overcoming both low literacy and numerical skills. If a pregnant adolescent appears unable to use appropriate measuring devices to determine portion sizes for her diabetic diet, color-coding food items in her kitchen, food items illustrated in a diabetes education booklet and the appropriate measuring device (spoon, cup or bowl) can help her to easily identify how much of each food item is allowed as one serving. For example, if a blue star means you should have one cup of that item as a dairy serving, a blue star is placed on the milk jug in the refrigerator, in the dairy section of the diabetic diet booklet and on a one-cup fluid-measuring cup. This technique can improve dietary compliance among adolescents for whom English is a second language as well as for those with poor numerical or literacy skills.

OVERCOMING BARRIERS TO BEHAVIOR CHANGE

It is especially important to identify and discuss potential barriers to behavior change with adolescents. By anticipating barriers and giving clients ways in which

- Color-coding can also be used to assist clients in determining the appropriate oven temperature to cook at. For instance, a blue dot is placed on the 300-degree F mark, a purple mark on the 350-degree spot and a red dot on the 400-degree mark. Each recipe is then color coded with a corresponding color of dot. A pictorial representation of a clock is used to show how much time each food item should be cooked.

EVALUATING EDUCATIONAL MATERIALS AND MESSAGES

It is important to the success of clients that health care professionals systematically evaluate the effectiveness of patient education materials and messages that are provided. The process can be done easily and quickly once it is learned and incorporated into the health education system.

- Ask clients to review your educational materials. Use clients from a variety of literacy and comprehension levels and from all cultural backgrounds that are reflected in your patient population. Offering small incentives for participating in educational material review can increase the likelihood that individuals will participate.
- Have a health care professional, student or volunteer sit down with clients to assist them with the evaluation process. Ask client evaluators to look at all aspects of the education materials, including illustrations and layout. Are illustrations appropriate in appearance and ethnicity? Are the illustrations acceptable and interesting to clients? If the illustrations depict a certain behavior, can the clients identify the behavior the illustration is depicting?
- Ask the clients to read sections of the pamphlet then ask them to interpret the message in their own words. Are clients of all ability levels able to read and comprehend the messages included? Do they interpret the message in the way in which it was intended? Or are there alternative ways in which a health message may be comprehended?
- Also ask clients to point out any words or phrases that were difficult to understand or read. Are there alternative words that you could use? If the information was a phrase, provide an explanation of the phrase to the client. Ask them to explain it to you in their own words.
- Have clients read a pamphlet. Afterward have them list the main points for you. Are clients able to identify the purpose of the materials? Are they able to determine the key points from other information? If not, the educational material will need to be revised.
- Provide easy ways for clients to track their own progress in behavior change. For instance, if a client is to drink a certain number of glasses of milk per week provide a series of handouts and a magnet to the client. Each of the handouts should have the specific number of glasses of milk listed on them. The client is then asked to post the sheets on the refrigerator door with the magnet. She is told to cross out or color in a glass on the handout each time she drinks a glass of milk. At her next prenatal visit she should bring in the sheet so that the health care professional can discuss her progress with her.
- Ask the client to teach you what she has learned about a healthy prenatal diet by asking her to plan a meal or revise a meal plan. Review the information with the client, offering praise when she has demonstrated her understanding of the diet and offering advice when she has demonstrated that she did not understand all concepts of the diet.

REFERENCES

1. Doak LG, Doak CC. Patient comprehension profiles. Recent findings and strategies. *Patient Couns Health Educ* 1980; 2(3):101-116.
2. Williams MV, Parker RM, Baker DW, Parikh NS, Pitkin K, Coates WC, et al. Inadequate functional health literacy among patients at two public hospitals. *JAMA* 1995;274(21):1677-1682.
3. Kirsch I, Jungeblut A, Jenkins L, Kolstad A. Adult literacy in America: a first look at the results of the National Adult Literacy Survey. Washington, DC: National Center for Education Statistics, US Department of Education, 1993.
4. Doak CC, Doak LLG, Root JL. Teaching patients with low literacy skills. 2nd ed. Philadelphia: J.B. Lippincott Co, 1996.
5. Fry E. Fry's readability graph: clarifications, validity and extensions to level 17. *J Reading* 1977;242-252.
6. Plimpton S, Root J. Materials and strategies that work in low literacy health communication. *Public Health Rep* 1994;109(1):86-92.
7. Hartman TJ, McCarthy PR, Park RJ, Schuster E, Kushi LH. Focus group responses of potential participants in a nutrition education program. *J Am Diet Assoc* 1994;94:744-748.

SELECTED RESOURCES

Selected materials for use when developing low literacy educational tools

1. Doak CC, Doak LG, Root JH. Teaching patients with low literacy skills. 2nd ed. Philadelphia: J.B. Lippincott Co, 1996.
2. Gaston N, Daniels P. Guidelines: writing for adults with limited reading skills. USDA Food and Nutrition Service.
3. Nitzke S, Shaw A, Pingree S, Voichick S. Writing for reading: a guide for developing print materials in nutrition for low literacy adults. University of Wisconsin – Madison, Extension Service.
4. Plimpton S, Root J. Materials and strategies that work with low literacy health communication. Public Health Rep 1994;109:86-92.
5. Schuster E. How do you identify non-readers? and Developing readable materials. Oregon State University Cooperative Extension Service. Low literacy website (Feb 4, 1999)
<http://osu.orst.edu/dept/ehe/index2.html>

Selected sources for low literacy patient education materials related to prenatal care and women's reproductive health

1. American College of Obstetricians and Gynecologists. 409 12th St. SW, Washington, DC 20024-2188. Telephone: (202) 863-2551. Contact person: Rebecca Rinehart. Topics: birth control pills and cesarean birth.*
2. Arizona Department of Health Services, Healthy Mothers, Healthy Babies Coalition. State Health Building, 1740 West Adams, Room 200, Phoenix, AZ 85007. Telephone: (602) 542-2948 / fax: (602) 542-1875. Contact person: Kathryn Butler. Topics: substance abuse.*
3. Metropolitan Nashville General Hospital. Pre and postnatal program, 72 Hermitage Avenue, Nashville, TN 37210. Telephone: (615) 862-4410 / fax: (615) 862-4399. Contact person: Yetteva Sheffield. Topics: prenatal care, infant care, breastfeeding.
4. Miller Litho. 365 Victor St., Suite D, Salinas, CA 93907. Telephone: (800) 995-4714. Topics: prenatal care, labor and delivery, breastfeeding.*
5. Childbirth Graphics Ltd. PO Box 21207, Waco, TX 76702-1207. Telephone: (800) 299-3366, ext. 2877 / fax: (817) 751-0221. Topics: AIDS.*
6. ETR Associates. PO Box 1830, Santa Cruz, CA 95061-1830. Telephone: (800) 321-4407 / fax: (408) 438-4284. Topics: general prenatal care.*
7. Florida Department of Health and Rehabilitative Services, Children's Medical Services Regional Perinatal Intensive Care Centers Program. 1311 Winewood Boulevard, Building B, Room 127, Tallahassee, FL 32399-0700. Telephone: (904) 488-6005 / fax: (904) 488-3813. Contact person: Mittie Moffett or Susan Folks. Topics: high-risk pregnancy.*
8. Healthy Mothers, Healthy Babies Coalition of Hawaii. 1413 South King St., Suite 209, Honolulu, HI 96814. Telephone: (808) 951-5805 / fax: (808) 941-4102. Contact person: Rose Schilt or Cynthia Uehara. Topics: prenatal calendar and checklist.*
9. Morning Glory Press. 6595 San Haroldo Way, Buena Park, CA 90620-3748. Telephone: (714) 828-1998 / fax: (714) 828-2049. Topics: adolescent pregnancy and postpartum care, including a workbook.*
10. Maine Department of Human Services, Division of Maternal and Child Health. 151 Capitol St., State House Station 11, Augusta, ME 04330. Telephone: (207) 287-3311 / fax: (207) 287-5355. Contact person: Diane Ricciotti. Topics: preterm labor.
11. Massachusetts Department of Public Health, Bureau of Parent, Child and Adolescent Health, Division of Perinatal Health, Massachusetts Genetics Program and New England Regional Genetics Group. New England Regional Genetics Group, 18800 Heritage Hills Drive, Brookeville, MD 20833. Telephone: (301) 570-6586 / fax: (301) 570-1756. Contact person: Virginia Rile. Topics: genetic screening.*
12. Massachusetts Department of Public Health, WIC Program, Diabetes Control Program. 150 Tremont St., Boston, MA 02111, Telephone: (617) 727-2013. Contact: Kate Alich. Topics: gestational diabetes.*
13. Missouri Department of Health. 1730 East Elm, PO Box 570, Jefferson City, MO 65102-0570. Telephone: (314) 751-6215 / fax: (314) 751-6010. Contact: Glenda Hamilton. topics: prenatal dictionary.
14. Model Cities Health Center. 430 North Dale St., St. Paul, MN 55103-2225. Telephone: (651) 290-9201 / fax: (651) 228-9878. Contact: Barbara Greene. Topics: substance use during pregnancy (geared toward African American women).

15. Native American Women's Health Education Resource Center. PO Box 572, Lake Andes, SD 57356. Telephone: (605) 487-7072 / fax: (605) 487-7964. contact Carey Luckenbach. Topics: birth control, sex education (geared toward Native American women).*

16. New York City Department of Health, Bureau of Maternity Services and Family Planning. Office of External Affairs, Material Development, 125 Worth St., Box 33, New York, NY 10013. Telephone: (212) 788-4362 / fax: (212) 788-4368. Contact person: Gina Vandestienne. Topics: reproductive health, pregnancy.*

17. New York State Department of Health. Bureau of Community Relations, 1084 Corning Tower, Albany, NY 12237. Telephone: (518) 474-5370 / fax: (518) 486-2361. Contact: John M. Cahill. Topics: adolescent pregnancy, HIV testing picture booklet, prenatal care booklets.*

18. Parenting Unlimited. Parenting Group, 301 Howard St, 17th Floor, San Francisco, CA 94105. Telephone: 415) 281-2767. Topics: perinatal care magazine for low literacy readers.

19. Practice Development. 2821 Second Avenue, Suite 1601, Seattle, WA 98121. Telephone: (800) 444-8806 / fax: (206) 441-7432. Contact: Betty Carey. Topics: prenatal care.*

20. Southern Regional Project on Infant Mortality. Sales Department, Council of State Governments, PO Box 11910, Lexington, KY 40578-1910. Telephone: (800) 800-1910. Topics: diary, calendar, organizer, quizzes, comic strips and workbook on prenatal care, preterm labor, breastfeeding, family planning, labor and delivery, postpartum care, infant and child care and child development.

21. California Diabetes and Pregnancy Program. Distribution Department, Education Programs Associates, 1 West Campbell Avenue, Building D, Room 40, Campbell, CA 95008. Telephone: (408) 374-3720 / fax: (408) 374-7385. Topics: gestational diabetes.*

22. US Department of Agriculture, Food and Nutrition Service. 3101 Park Center Drive, Alexandria, VA 22302. Topics: Health tips for moms after delivery.

23. Vida Health Communications and National Organization of Gynecologic, Obstetric and Neonatal Nurses. Vida Health Communications, 6 Bigelow St., Cambridge, MA 02139. Telephone: (617) 864-4334. Topics: videotape series on adolescent pregnancy.

Selected sources for low literacy patient education materials related to nutrition and breastfeeding

1. Boston Department of Health and Hospitals, Health Education and Training Center. 434 Massachusetts Avenue, 2nd Floor, Boston MA 02118. Telephone: (617) 534-5181 / fax: (617) 534-5179. Contact: Regina Hobbs. Topics: eating breakfast.

2. Maine Department of Human Services, Division of Maternal and Child Health. 151 Capitol St., State House Station 11, Augusta, ME 04333. Telephone: (207) 287-3311 / fax: (207) 287-4631. Contact: Kathy Savoie. Topics: adolescent pregnancy and diet, reducing food costs, nutrition fact sheets, feeding young children, fat reduction, eating 5 fruits/vegetables a day, eating out.

3. Massachusetts Department of Public Health, WIC Program. Nutrition Education Task Force, 250 Washington St., Boston, MA 02108-4619. Telephone: (617) 624-6000 / fax: (617) 624-5206. Contact: Claudio Ayala. Topics: adolescent pregnancy and diet, pictorial nutrition guide, weight gain, breastfeeding, iron, feeding infants and children, child obesity.*

4. Philadelphia Department of Public Health, Office of Maternal and Child Health. 500 South Broad St., Philadelphia, PA 19146. Telephone: (215) 685-6825 / fax: (215) 685-6806. Topics: prenatal nutrition for adolescents, booklet and video.*

5. University of Minnesota, Minnesota Extension Service. Distribution Center, 20 Coffey Hall, 1420 Eckles Avenue, St. Paul, MN 55108. Telephone: (612) 625-5749 / fax: (612) 625-6281. Topics: choosing healthy foods with the food pyramid.

6. Wisconsin Department of Health and Social Services, Division of Health. WIC Program, PO Box 309, Madison, WI, 53701. Telephone: (608) 261-6381. Contact: Judy Hoenisch. Topics: nutrition during pregnancy, infant feeding, feeding young children.

7. Best Start Social Marketing. 3500 East Fletcher Avenue, Suite 519, Tampa, FL 33613. Telephone: (800) 277-4975 / fax: (813) 971-2280 / e-mail: best@holonet.net. Contact: Bonnie Salazar. Topics: list of PSAs, videotapes, posters and pamphlets on breastfeeding.*

8. Harbor-UCLA Medical Center, Research and Education Institute, WIC Program. 2930 West Imperial Highway, Suite 622, Inglewood, CA 90303. Telephone: (213) 757-0191 / fax: (213) 757-1191. Contact: Silvia Santos. Topics: breastfeeding.*

9. Texas Department of Health, Bureau of WIC Nutrition. 100 West 49th St., Austin, TX 78756. Telephone: (512) 458-7437 / fax: (512) 458-7447. Contact: Janet Rourke. Topics: breastfeeding.*

* materials available in languages other than English.

Readability and medical comprehension tests

1. Markwardt FC. Peabody Individual Achievement Test. American Guidance Service, Circle Pines, MN.
2. Test of Functional Health Literacy in Adults (TOFHLA). Center for the Study of Adult Literacy, Georgia State University, University Plaza, Atlanta, GA 30303-3083. Contact: Joanne R Nurss, Director.
3. REALM test. Department of Internal Medicine, Louisiana State University, PO Box 33932, Shreveport, LA 71130-3932. Contact: Peggy Murphy.
4. Taylor W. Cloze procedure: a new tool for measuring readability. *Journalism Q* 1953;30:415-433.
5. Wide Range Achievement Test (WRAT 3). Wide Range, Inc., 1526 Gilpin Ave., Wilmington, DE 19806.
6. Slosson RL. Slosson Oral Reading Test (SORT) revised. Slosson Educational Publications, 538 Buffalo Rd., East Aurora, NY 14052.

Programs to determine readability levels

1. Fry E. Fry's readability graph: clarifications, validity and extensions to level 17. *J Reading* 1977; 242-252.
2. Readability analysis. Gamco Industries Inc., PO Box 1826N, Big Springs, TX 79721-9990.
3. Button J. PC-Style. Bellevue, WA: Buttonware.
4. Wampler BE, Williams MP. Grammatik III: The writing analyst. San Francisco: Reference Software.
5. Mclaughlin GH. SMOG grading – a new readability formula. *J Reading*. 1969;12:639-46.

Background information

1. Doak CC, Doak LLG, Root JL. Teaching patients with low literacy skills. 2nd ed. Philadelphia: J.B. Lippincott Co, 1996.
2. Macario E, Emmons KM, Sorensen G, et al. Factors influencing nutrition education for patients with low literacy skills. *J Am Diet Assoc* 1998; 98:559-564.
3. Betterley C, Dobson B. Evaluation tools for nutrition education materials. *J Nutr Educ* 1990;22:140B.
4. Nitzke S. Improving the effectiveness of nutrition education materials for low literacy clients. *Nutr Today* 1989(Sept/Oct):17-23.
5. Nitzke S, Aderman B, Voichick J. Developing materials for low-income, low-literacy audiences. *J Nutr Educ* 1986;18:226B.
6. Busselman KM, Holcomb CA. Reading skill and comprehension of the Dietary Guidelines by WIC participants. *J Am Diet Assoc* 1994;94:622-625.
7. Ruud J, Betts NM, Dirx J. Developing written nutrition information for adults with low literacy skills. *J Nutr Educ* 1993;25:11-16.
8. Plimpton S, Root J. Materials and Strategies that work in low literacy health communication. *Public Health Rep* 1994; 109(1): 86-92.
9. Murphy PW, Davis TC. When low literacy blocks compliance. *RN*. 1997; 60(10):58-64.
10. Davis T, Crouch M, Long S, et al. Rapid assessment of literacy levels of adult primary care patients. *Fam Med* 1991; 23:433-435.
11. Davis T, Long S, Jackson R, et al. Rapid estimate of adult literacy in medicine (REALM): a shortened screening instrument. *Fam Med* 1993; 25:391-395.
12. Schuster E. How do you identify non-readers? and Developing readable materials. Low literacy website. <http://osu.orst.edu/dept/ehe/index2.html>.