Strategies to Increase Health Literacy in The Infant Feeding Series (TIFS): A Six-Lesson Curriculum for Low-Income Mothers

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Low literacy can be a serious barrier to educating audiences about important health issues. This article explicates strategies used to increase health literacy in The Infant Feeding Series, a six-lesson curriculum on infant feeding practices. The curriculum was developed by a multidisciplinary team of researchers, health educators, and community stakeholders with the primary goal of increasing low-income mothers’ knowledge and self-efficacy to delay the introduction of solid foods into infants’ diets. Strategies used to develop the low-literate accessible materials include (a) incorporation of formative research and theory, (b) media components, (c) reading level assessment of materials, (d) review of materials by multiple stakeholders, (e) one-on-one home delivery, (f) pilot evaluation of lessons, and (g) a workbook incentive designed to integrate knowledge and motivate participants to complete the curriculum through scrapbook activities. These strategies are discussed as they relate to lesson content and curriculum effectiveness.

Keywords: health literacy; infant feeding; The Infant Feeding Series

Health education and promotion materials exist for a wide range of health issues. Although many of the materials are easily accessible to the lay public, just as many are not. Oftentimes, the content is complex, lengthy, full of jargon, culturally insensitive, cluttered, and without illustrations (Plimpton & Root, 1994), creating barriers for understanding and engagement of recommended behaviors. Health literacy, defined as the degree to which individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions (Institute of Medicine, 2004), has become a primary interest for health providers, educators, and communicators as the necessity for accessible and useful information becomes linked to more positive health outcomes (U.S. Department of Health and Human Services, 2000). For example, the American Association of Pediatrics (AAP, 2004) recommends that infants do not begin solid foods until 4 to 6 months, but many mothers are unaware of the guidelines or believe their babies are exceptions to them (Horodynski et al., 2007). Research has demonstrated that infants will have less risk of developing Type 1 diabetes mellitus and a decreased risk for later childhood obesity if AAP guidelines are adhered to (Ziegler, Schmid, Huber, Hummel, & Bonifacio, 2003). Thus, it becomes important that the guidelines be communicated in a way that increases comprehension, motivation, and self-efficacy to promote mothers’ adherence to the AAP guidelines.

This article presents a systematic approach to the development of a six-lesson curriculum on infant feeding practices designed for low-income women. The primary aim is to provide an exemplar for the development of other curricula across health domains. First, the problem of low health literacy is discussed as it relates to infant feeding practices. Then, an explanation of The Infant Feeding Series (TIFS) is provided along with details regarding the strategies used in TIFS to increase health literacy. Finally, the overall effectiveness of TIFS is discussed along with lessons learned from the TIFS development process.

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HEALTH LITERACY AS A RISK FACTOR

According to the National Adult Literacy Survey, approximately 50% of all American adults have limited literacy skills (Bernhardt & Cameron, 2003). Limited literacy skills impede the ability to successfully navigate tasks that require problem-solving abilities or higher reading skills. When extended to the health context, low health literacy has been found to be associated with fewer preventive treatments and more unhealthy behaviors (Kalichman, Ramachandran, & Catz, 1999). For example, researchers have found that low health literate individuals are more likely to miss treatments than patients with functional health literacy (Kalichman et al., 1999) and are less likely to perform follow-up and preventive treatments (Lindau, Basu, & Leitsch, 2006). Individuals with low health literacy also have limited knowledge and understanding of medical treatments and instructions (Davis et al., 2006; Williams, Baker, Honig, Lee, & Nowlan, 1998) and can be less aware about self-managing a disease and determining when to access health care (Williams et al., 1998). Table 1 provides further explanation of the impact of low health literacy.

When they do access health care, persons with low health literacy often have less effective communication with their health care providers than individuals with adequate health literacy, and they are less able to communicate their condition to medical professionals than those with moderate or high health literacy (Roter, 2000). Low health literacy puts families at risk (Porr, Drummond, & Richter, 2006), and certain demographic characteristics, including ethnicity, age, and income, are associated with greater likelihood of low health literacy (Paasche-Orlow, Parker, Gazmararian, Nielsen-Bohlman, & Rudd, 2005).

Ethnicity and Age

Studies that link ethnic/racial groups to lower health literacy found that African Americans scored lower on health literacy measures than European Americans even when age and education were controlled (Shea et al., 2004) and Latina women had difficulty interpreting health information even when materials were presented in Spanish (Garbers & Chiasson, 2004). In an effort to counter this problem, the National Standards on Culturally and Linguistically Appropriate Services (2001) requires health care organizations make easily understood patient-related materials available to patients. In addition to ethnicity, younger individuals were more likely to have lower health literacy because of their inexperience with health professionals, limited knowledge of health-related vocabulary, and fewer years of education (Andrus & Roth, 2002). Young mothers in particular have the potential for low health literacy because of challenges such as lack of preparedness for parental responsibility, little experience with children and health professionals, and dependence on other sources for financial support (Bentley, Gavin, Black, & Teti, 1999).

Low-Income Mothers

Overall, individuals with lower incomes are more likely to exhibit low health literacy than individuals with higher incomes (Bernhardt & Cameron, 2003). Low literacy is also more prevalent among adults who receive public assistance or food stamps than the general population (Educational Testing Service, 1995). For example, women enrolled in the supplemental nutrition program for women, infants, and children (WIC) who are identified as nutritionally at risk and provided with food supplements high in nutrients like protein, calcium, iron, and Vitamins A and C (Food and Nutrition Service of the USDA, 2007) are often less likely to adopt healthy behaviors than their upper economic class counterparts. In one study, mothers enrolled in WIC were less likely to adhere to AAP guidelines that recommend mothers breastfeed exclusively and delay the introduction of solid food until the infant is 4 to 6 months than mothers not enrolled in the program (Jacknowitz, Novillo, & Tiehen, 2007). Other research has also demonstrated a lower level of adherence to AAP guidelines among WIC.

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It is important to note, however, that low-income status is only a correlate with low health literacy, not a synonym for it; in other words, even though low-income women might be at higher risk for lower health literacy, they are not necessarily low in health literacy. One study, for example, identified that many WIC mothers scored high on literacy measures and were more likely to breastfeed than lower literate WIC mothers (Kaufman, Skipper, Small, Terry, & McGrew, 2001).

Thus, low adherence among low-income mothers to AAP guidelines and their higher potential for low health literacy indicate that low-income mothers compose a priority population for health education and interventions that aim to increase their health literacy. Researchers and practitioners interested in designing health education materials for low-literate groups need to be sensitive to health literacy by adopting strategies that make the information accessible and effective (Joint Committee on National Health Education Standards, 1995). TIFS provides one exemplar for how to create accessible materials when developing a health education curriculum within the context of infant feeding practices for low-income mothers.

> **TIFS CURRICULUM**

**Curriculum Overview**

The TIFS curriculum, comprised of six lessons designed to help low-income mothers and pregnant women increase awareness and knowledge of healthy baby nutrition practices, was deemed necessary because of research that demonstrated that mothers often do not adhere to the AAP recommendation to introduce solid foods no sooner than 4 to 6 months (AAP, 2004). Infancy is a critical period during the life cycle and the early introduction of foods other than formula or breast milk prior to the recommended time frame is a risk factor for later obesity (Baker, Michaelsen, Rasmussen, & Sorensen, 2004; Dennison, Edmunds, Stratton, & Pruzek, 2006; Ong, Ahmed, Emmett, Preece, & Dunger, 2000), diabetes (Ziegler et al., 2003), and allergies (Hampton, 1999). Appropriate feeding practices during infancy lay the foundation for nutritional health, growth, development, and prevention of health problems (“Position of the American Dietetics Association,” 2005). Therefore, TIFS lessons were designed to increase participants’ knowledge, self-efficacy, and behavioral intention to engage in the recommended AAP guideline to introduce solid foods to infants at 4 to 6 months.

To meet the aforementioned goals, TIFS provided six weekly, one-on-one lessons that included information about AAP recommendations, strategies for communicating about infant health with family and health providers, and planning ideas for infant feeding (see Table 2 for a brief description of each lesson; access the complete curriculum at www.nursing.msu.edu/tifs). After each lesson, participants engaged in a workbook activity and received a magnet message for their refrigerators that provided a reminder for the information

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**TABLE 1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Outcome</th>
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<tr>
<td>Shame, stigma, and denial</td>
<td>Sometimes patients lie about problems with literacy to avoid embarrassment or discovery.</td>
</tr>
<tr>
<td>Poor patient–provider communication</td>
<td>Low-literate patients are less capable of communicating with health care professionals, more likely to be misdiagnosed, and have difficulty understanding medical instructions.</td>
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<tr>
<td>Limited knowledge/understanding</td>
<td>Low health literacy often means less medical knowledge about tests and the purpose of medicines as well as increased misconceptions about health and medicine.</td>
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<tr>
<td>Unhealthy behaviors/poor treatment adherence</td>
<td>Low-literate patients are more likely to not comply with treatments and more likely to engage in unhealthy behaviors.</td>
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<tr>
<td>Adverse health outcomes</td>
<td>Patients with low health literacy are more likely to rate their health as poor and have increased rates of morbidity.</td>
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<tr>
<td>Increased health care costs</td>
<td>Low-literate patients have higher rates of hospitalization, especially long term.</td>
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learned that day. Each of the six lessons met standards and goals associated with sensitivity to literacy and culture with the primary goal of increasing health literacy on the topic of infant feeding. Next, strategies that were salient in our approach to TIFS curriculum development will be addressed, including attention to (a) theory, (b) formative research, (c) cultural sensitivity, (d) reading level, (e) media use, (f) lesson content (hands-on activities, props, handouts, workbook activities, and magnets), (g) one-on-one home delivery, and (h) stakeholder review and pilot evaluation of lessons.

STRATEGIES TO INCREASE HEALTH LITERACY IN THE TIFS CURRICULUM

Theory-Based Approach

TIFS curriculum was based on a strong theoretical foundation to guide formative research, lesson content, and evaluation with salient constructs and factors that might influence mothers. The curriculum integrated the Theory of Planned Behavior (TPB; Ajzen, 1985) and the Transtheoretical model (TTM; Prochaska & DiClemente, 1983) as frameworks for understanding factors associated with adherence to the AAP recommendation (Horodyski et al., 2006). The TPB identifies attitude, subjective norm, and perceived behavioral control as predictors of behavioral intention, which subsequently predicts behavior (Ajzen, 1991). The TTM, a stage theory, is based on the idea that individuals are at different stages of readiness to engage in a recommended behavior; thus, interventions should match each person’s respective stage. The researchers used constructs of the theories to develop a moderator guide for formative research with mothers and health care providers regarding their attitudes, values, beliefs, and behavior about solid foods and infant diets. The researchers also systematically integrated the two theories into the development of the curriculum by including lesson content that attempted to (a) change attitudes (e.g., provided information to show that delaying introduction of solid foods is healthy for infants), (b) increase perceptions of control and self-efficacy (e.g., identified strategies that focused on increasing perceptions that mothers can delay the introduction of solid foods), (c) acknowledge changes in norms (e.g., provided new evidence stating that mothers should wait until 4 to 6 months to introduce solid foods), (d) use multiple interactive strategies to move individuals into behavior change (e.g., worksheets, role-plays, media), and (e) increase behavioral intention to engage in the recommended behavior (e.g., mothers completed a plan for action). The theories also helped to identify constructs used in evaluation activities.

Formative Research

Extensive formative research was conducted as a basis for audience analysis and lesson content development. Six focus groups were conducted with 23 participants (12 White, 9 Black, and 2 biracial White and Black). The participants for this study were low-income women enrolled in Medicaid programs and were recruited through breastfeeding, nutrition education, and parenting programs. Six focus groups were also held with health care professionals and paraprofessionals (i.e., a lay helper who is trained

<table>
<thead>
<tr>
<th>Lesson Title</th>
<th>Goal of Lesson</th>
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<tr>
<td>Lesson 1: How do I feed my baby?</td>
<td>Develop mother’s ability to determine when baby is ready to be fed solid foods</td>
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<tr>
<td>Lesson 2: How can I help my baby develop into a healthy eater?</td>
<td>Increase mother’s understanding of baby’s development as it relates to feeding</td>
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<tr>
<td>Lesson 3: What is my baby telling me about eating?</td>
<td>Increase mother’s understanding of baby cues and how to use these to help feed her baby</td>
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<tr>
<td>Lesson 4: How does temperament affect how my baby eats?</td>
<td>Increase mother’s understanding of baby temperament and how this understanding can help her feed her baby</td>
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<td>Lesson 5: How do I talk to others about my baby’s feeding needs?</td>
<td>Increase mother’s information-seeking skills and verbal strategies for delaying the introduction of solid foods</td>
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<tr>
<td>Lesson 6: What is my plan for feeding my baby?</td>
<td>Help the mother develop a plan for how she would like to feed her baby</td>
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Note: TIFS = The Infant Feeding Series.
and supervised by professional staff but whose primary competencies include life experience and ability to work with families \((n = 38)\) to identify barriers and objectives for the lessons. Questions were designed using the TPB to uncover knowledge, attitudes, beliefs, and family norms surrounding infant feeding. Questions were also asked regarding the current information participants received from various health care providers. The focus groups were audio recorded, transcribed verbatim, and analyzed using content analysis methods described by Krueger and Casey (2000). Three themes emerged from the data collected in mother focus groups: (a) maternal knowledge about infant feeding, (b) maternal perceptions of applicability of infant feeding guidelines, and (c) manner and type of information useful for infant feeding decisions (Horodynski et al., 2007). These themes, existing research, and theory were used to guide curriculum development.

**Culturally Sensitive**

There was a keen awareness on the part of the research team that the priority population comprise women from different ethnic/racial backgrounds. Materials were developed and reviewed to include unbiased, nonjudgmental language. For example, some African American participants in the pilot evaluation noted that although they liked the visuals the media provided (i.e., a DVD created for the project), they felt some of the humor was inappropriate; therefore, the offending humorous language was removed. Additionally, all lesson materials and media were balanced in their racial composition with African American, Latino, Asian, and European American babies represented across all visual content.

**Literacy Level of Materials**

Printed health materials are often written at a reading level that is too high for patients with low health literacy to understand (Doak, Doak, Friedell, & Meade, 1998; Safeer & Keenan, 2005); thus, all materials in the TIFS curriculum were subjected to a reading level assessment. Because most individuals read at about the 8th grade level and health information is often written at the 10th grade or college level, all lesson materials for the participants were not above an 8th grade reading level, and handouts averaged a 6th grade reading level. Researchers used simple sentence structure, limited large multisyllabic words (e.g., “temperament”), and incorporated large print and white space on materials. Researchers also worked with a graphic designer to use appropriate fonts, images, and other layout techniques to improve health literacy while still maintaining each lesson’s accuracy and portrayal of information (Osborne, 2005). The aforementioned strategies increased the accessibility of materials for low literate audiences such that no comprehension problems were reported by participants or paraprofessionals.

**Media Content**

Instructional graphics can increase comprehension if they stimulate viewers and provide clarity on complex topics (Davis et al., 1998). Thus, media were included in the form of a DVD shown to the mothers on a portable DVD player in their homes. The content of the DVD was developed using graphs, animation, and live actors in a pediatrician–patient context to better illustrate complex topics and multistep processes. Specifically, a graphical depiction of the digestive system illustrated how solid foods are digested with difficulty in infants. Also, an animated character discussed infant temperament, cues, and communication issues in lay friendly terms for participants. The thoughtful use of media attempted to stimulate involvement and enhance learning (Meade, McKinney, & Barnas, 1994).

**Hands-on Activities**

Hands-on activities generally engaged individuals, providing tangible reinforcement that helped to increase involvement and application of new knowledge learned from the TIFS curriculum. TIFS lessons included props, handouts, and workbook activities that encouraged interactivity as well as magnets for visual reminders and positive reinforcement.

**Props.** Props were used to illustrate various concepts to participants throughout the lessons. For example, in Lesson 1, the activity “Bottles, Cups, and Spoons” was used to teach participants how to recognize a solid food by allowing them to actually see the consistency of applesauce, baby food, thickened formula with rice cereal, and formula. This activity helped participants learn to identify what a solid food was and to understand why early introduction of solid foods may be harmful to the baby. In Lesson 3, “Baby Cue Cards” were used to show pictures of baby signals or cues to communicate. One example was a picture of a baby “raising a hand” to depict a “stop” signal, conveying the baby’s need for a break. Use of props helped participants retain information and gave them hands-on experience related to lesson goals.

**Handouts.** Each lesson included a variety of handouts created for participants to insert in their workbooks and use as a resource. For example, in Lesson 5, participants
received the handout “Making the Most of My Baby’s Health Care Professional Visit.” This handout provided a detailed checklist of suggested strategies for each participant to use before, during, and after her baby’s health care visit. Strategies included writing down questions to ask the health care professional, bringing a notepad and pen to the health visit, and following-up with the health care professional with any questions the participant may have following the health visit.

Workbook activities. The challenge of retaining participants for a six-lesson program delivered during a period of 6 to 8 weeks was important to acknowledge as a barrier. Innovative strategies were necessary to encourage participants to remain part of the health promotion program so they were able to gain the full value of the curriculum, which in turn increased the likelihood of adherence to the AAP guideline. The workbook had question sheets and scrapbook activities as novel incentives for retention (Shirer, 2006). Workbook activities were integrated throughout the curriculum to introduce, teach, and reinforce key concepts related to infant development, feeding practices, and communication.

Magnets. Each week, participants received a different reminder that reflected lesson content learned that week. For example, the Lesson 5 magnet reminder read “Plan ahead. Ask questions. Be assertive. You can do it!” to encourage effective communication with physicians. Participants were encouraged to place the magnets in a prominent place (i.e., their refrigerators) to serve as a visual cue to reinforce knowledge learned or to maintain a recommended behavior.

One-on-One Delivery

TIFS was designed for individual delivery in participants’ homes, particularly because mothers with newborns are less likely to leave their homes to access services. One-on-one delivery of the curriculum allowed for individualized attention and information tailoring to ensure information was understood. Weekly, individual meetings also enabled women to develop a relationship with the paraprofessionals, which created a comfortable climate for participant questions and clarification of lesson content.

Pilot Evaluation Results and Stakeholder Review

The last strategy used to develop final lesson content included a pilot evaluation and a stakeholder review of the lessons with low-income mothers. Participants from our priority population of low-income mothers and paraprofessionals who delivered the material participated in a formal pilot evaluation, and then data and lesson content were reviewed by researchers from various disciplines. Results for the pilot evaluation are provided next with an extended explanation of results from the mother pilot study to provide evidence of effectiveness for TIFS.

Mother pilot results. Mothers (n = 28) who participated in the pilot evaluation all received some form of public assistance. Approximately 43% (n = 12) did not complete high school, whereas 29% (n = 8) completed high school and 28% completed at least some college or vocational education. Mothers’ literacy levels were not directly measured; however, the high incidence of health literacy across populations in general, the low educational level of much of the group, and their low-income status were associated with low literacy levels (Educational Testing Service, 1995; Paasche-Orlow et al., 2005). Mothers completed pre- and post–parent surveys for each of the six lessons and responded to a delayed post–phone call to determine if they had adhered to the AAP recommendation to delay the introduction to solids until their infant was between 4 to 6 months old. The evaluation tool was comprised of the following subscales: Knowledge About Infant Feeding Practices (7 items, α = .73); Self-Efficacy in Appropriate Transition to Solids (9 items, α = .94), Knowledge About Infant Temperament (4 items, α = .96), and Self-Efficacy in Talking With Physicians, Friends, and Family Members About Feeding Decisions (8 items, α = .72).

Quantitative results of the pilot evaluation indicated that mothers had greater knowledge about feeding practices, t(28) = 3.86, p < .01, d = .65, were more able to accurately identify infant engagement cues, t(28) = 2.05, p < .01, d = .38, and reported higher self-efficacy related to adhering to AAP guidelines, t(28) = 3.78, p < .01, d = .70, after having completed the curriculum (postassessment). Effect sizes were considered medium to large (Cohen, 1988). Twenty-five of the 29 mothers participated in the delayed postassessment. Of these mothers, all but one adhered to the recommended AAP guideline to delay the introduction to solids to infants until their infant was between 4 and 6 months of age. These results provide evidence that support the effectiveness of the curriculum.

Qualitative results of the pilot evaluation were also positive; participants stated that TIFS lessons were “very helpful.” Mothers identified an increase in their own knowledge about knowing when to start feeding their baby solids (e.g., “knowing not to feed my baby solids too early”) and how to communicate effectively about their baby at their health visit (e.g., “asking the doctor questions”). Participants especially liked the
hands-on activities, particularly the workbook activities that entailed scrapbooking, viewing media segments, and role-play activities. Mothers’ comments also indicated that they appreciated the comprehensive nature of the curriculum that placed knowledge in a larger context. One mother explained, “They don’t just tell you why you shouldn’t do these things (i.e., premature introduction of solids) but the consequences of those things if you do them.” Mothers also liked the one-on-one interaction with their paraprofessionals, referring to it as “real interaction.”

Paraprofessionals. Paraprofessionals (n = 7), the individuals who delivered the lessons, completed instructor surveys after each lesson (i.e., the paraprofessional completed an instructor survey for each of the six lessons). The survey assessed each lesson’s overall effectiveness; the utility of the activities, media, supplemental materials, and equipment; the success of each lesson with the participants; suggestions for improvement; what the instructor enjoyed most about the lesson; and any other comments or suggestions. Paraprofessionals identified the interactions with the participants as positive, particularly the hands-on activities. One instructor during the debriefing session noted, “One mother took these lessons as a second chance. She had not done well in school, and she was determined to do her homework each week and show off what she had learned and how she was using the information.” Other instructors agreed and noted changes in participants’ self-confidence in taking care of and feeding their babies. Paraprofessionals also attended a debriefing session with the research team, where they shared their thoughts about the curriculum, activities, and media.

Stakeholder review. The research team, comprising researchers from multiple disciplines, health educators, and program staff, reviewed the curriculum, media content, and data from both the parent and instructor surveys. The data provided insight that helped the research team make revisions to clarify key terms and activity directions, provide supplemental materials to the lessons as needed, reorganize the order of the lessons with regard to infants’ development and feeding, and make other selected changes. Throughout the revision process, researchers paid close attention to ensure that the TIFS lessons were culturally appropriate and included relevant information regarding infant feeding in all lessons, activities, and media.

DISCUSSION

The problem of health literacy extends beyond the lay public’s lack of understanding of health information to include organizations that often communicate information ineffectively (Plimpton & Root, 1994). Producers of health information need to better tailor messages to audiences by understanding the barriers associated with health literacy and implementing strategies to improve health outcomes for individuals. The current TIFS project, aimed at low-income mothers who often have limited education and health literacy skills, focused on the problem of introducing solid foods too soon into infants’ diets because of negative effects like later obesity (Baker et al., 2004), diabetes (Ziegler et al., 2003), and allergies (Hampton, 1999). Evaluation data revealed that the curriculum was effective; all but 1 of the 25 mothers contacted at postcurriculum follow-up adhered to the AAP recommendation to wait until 4 to 6 months to introduce solid foods. Based on both quantitative and qualitative evidence, there are many lessons to be learned from the TIFS curriculum development process.

Theory Is Important

In the abstract, theory often seems unimportant, perhaps even lofty when dealing with very real problems like helping people understand essential health information. In reality, theory guides practitioners in a planned direction and provides a framework for how we might most effectively direct our efforts. For example, the TPB (Ajzen, 1985) focused our efforts on attitude, perceived behavioral control, and behavioral intention to delay the introduction of solid foods. The primary goal was to share tailored information that would affect participants’ attitude about the recommended behavior and increase their perceptions of control or self-efficacy so that they would increase their intention to delay the introduction of solid foods and subsequently adopt the recommended behavior. The clear objective allowed for a focus on the desired outcomes, paring down information so that only essential lesson content remained. The TTM (Prochaska & DiClemente, 1983) posited that each participant may be at a different stage of readiness, sensitizing researchers to the need for incorporating multiple learning techniques and pilot testing of materials to address the different needs and barriers of participants. Overall, theory informs strong practice, particularly within the context of a low health literate population.

Formative Research Is Necessary

Formative research is essential for obtaining information about an audience’s knowledge, attitudes, beliefs, literacy levels, and other salient information. Systematic formative research that encompasses multiple stakeholders (e.g., priority population, paraprofessionals, and content experts) provides the greatest opportunity for insightful input and
data collection that can improve curriculum content and its delivery to influence behavior. For example, formative research revealed that low–socioeconomic status women lacked self-efficacy in communicating well with their physicians, which resulted in the creation of a lesson on communication skills. Formative research is also important for piloting of materials to test the appropriateness of content with audiences of various cultural backgrounds and to also examine the audience’s ability to comprehend the materials. Overall, data from formative research are essential for identifying and assessing the effectiveness of intervention strategies.

**Make Content Accessible**

Reading level assessments are critical to determining the appropriateness of the lesson content and other materials. As previously indicated, most health materials are written at too high a level for people with low health literacy to understand. Attention to the visual layout and graphics included as content is also important. Specifically, dividing content into appropriate sections, including visual information and examples, and using interactive instructions will increase the effectiveness of the materials when communicating to low literate audiences (Doak et al., 1998). For an intervention to be effective, materials should also be culturally sensitive, reflecting the diversity of a given audience to create perceived similarity between participants and the visual representations in the message content. Perceived similarity may serve to increase the likelihood that participants will attend to message content and later engage in recommended behaviors because materials are appealing and inclusive of groups with whom they identify.

**Multiple Learning Strategies**

Many health education programs and interventions rely too heavily on printed materials and should consider alternative strategies that advantage participants rather than distance them from being able to comprehend information and use it effectively. Many low literate individuals may have trouble reading printed materials; thus, using a variety of strategies can help increase understanding and subsequent adherence to recommended behaviors. Hands-on activities, media supplements, visual props, and simple response activities that asked participants to actively apply content were critical educational strategies incorporated to engage participants. In sum, multiple learning strategies that encourage interactivity are necessary to gain attention and increase comprehension so that recommended behaviors have the strongest chance of being implemented over time.

**CONCLUSION**

Preliminary evaluation results indicate TIFS is a feasible curriculum on infant feeding practices, with an acceptable literacy level that is culturally sensitive and useful for new and expectant mothers. Theoretically driven curriculum development that is sensitive to low literacy is essential for increased knowledge, attitude change, and/or behavior change or reinforcement.

Curriculum development strategies that were clearly useful in creating TIFS included our use of a multidisciplinary team with multiple stakeholders, a reliance on theory and evidence-based research, and a willingness to take the time to go through multiple revisions of the curriculum based on stakeholder feedback. Although TIFS development was a time-consuming and rigorous process, the strategies discussed in this article provide a model for health communicators, educators, and promoters to use when developing health-related materials. The TIFS project’s process model is a useful guide and tool that illustrates how materials can be maximized and tailored to low literate audiences.

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