
Development of an Interactive Pregnant Adolescent Nutrition Education Workshop

Nancy J. Wise, PhD, RN

Mary Ann Cantrell, PhD, RN, CNE, FAAN

Frances Hadley, RD, LDN, CDE

Kimberly Joyce, RN

ABSTRACT

The health of pregnant adolescents affects the well-being of future generations. Modifying unhealthy eating patterns among pregnant adolescents is critical because of their association with risk of poor pregnancy and birth outcomes. Therefore, it is important to provide age- and developmentally appropriate nutrition education during this time. To sustain healthy behavior changes, nutrition interventions must be grounded in theory and reflect both motivating factors and barriers to healthy eating. Factors such as taste preferences, personal self-efficacy, developmentally appropriate nutrition education, and hands-on meal preparation have been identified as influences on dietary patterns in this population. The purpose of this article is to describe the development of an evidence-based nutrition education program for pregnant adolescents based on Pender's health promotion model.

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INTRODUCTION

Healthy eating among pregnant adolescents is essential to optimal growth and development (Centers for Disease Control and Prevention, 2015a). The health of pregnant adolescents in particular contributes to the health of future generations because nutrition status during pregnancy affects the developing fetus (Sawyer et al., 2012) and diet quality is a determinant of maternal and infant health (Reyes, Klotz, & Herring, 2013). Specifically, healthy eating

during adolescent pregnancy decreases the likelihood of adult chronic illnesses (Huang, Lee, & Lu, 2007; Moreno et al., 2010) and reduces pregnancy and birth complications such as low birth weight (Barger, 2010; Stang, Story, & Feldman, 2005). According to Johnson and Moore (2015), pregnancies and childbirth during the adolescent phase account for 23% of the disease burden arising from pregnancy and childbirth. Therefore, modifying high-risk health behaviors such as unhealthy eating

patterns in pregnant adolescents is critical (Barger, 2010; Johnson & Moore, 2015; Notkin-Nielsen, Gittelsohn, Anliker, & O'Brien, 2006).

Despite this critical need to modify unhealthy eating among pregnant adolescents, the evidence base for nutrition interventions that target the pregnant adolescent population is limited (Johnson & Moore, 2015). Compounding this limited evidence is that what has been published is outdated (Bechtel-Blackwell, 2002; Croll, Neumark-Sztainer, & Story, 2001; Long, Martin, & Janson-Sand, 2002; Skinner, Carruth, Ezell, & Shaw, 1996; Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007; Wrieden & Symon, 2003). Consequently, there is a need for current evidence in designing effective nutritional education interventions for pregnant adolescents (Brown, McIlveen, & Strugnell, 2000; McNaughton, 2011). The purpose of this article is to describe the development of an evidence-based nutrition education program for pregnant adolescents.

Background

Awareness of healthy eating among pregnant adolescents does not necessarily translate into healthy food choices (Brown et al., 2000; Wise, 2015). Adolescents, overall, often lack adequate knowledge of healthy food choices and may not understand the connection between healthy eating and positive birth outcomes (Montgomery, 2003a). For some adolescents, healthy eating is associated with “not eating too much junk” rather than a true knowledge of healthy food (Stevenson et al., 2007; Wise, 2015). According to Montgomery (2003b), “adolescents tend to think concretely and can relate to specific foods better than vague nutrients of which of have little knowledge” (p. 23). Although a lack of knowledge about nutrition can predispose adolescents to poor eating habits, knowledge of healthy foods has been shown to be insufficient in motivating adolescents to change their dietary behaviors. In addition to nutrition knowledge, factors that influence dietary habits in adolescents include peers, family support, and sociodemographic factors influencing eating behavior (Cutler, Flood, Hannan, & Neumark-Sztainer, 2011; Story, Neumark-Sztainer, & French, 2002). Symbolic meanings associated with food (Ioannou, 2009), social norms (Stead, McDermott, MacKintosh, & Adamson, 2011), and personal self-efficacy also affect food choices (Nothwehr, 2008; Strachan, & Brawley, 2009). Personal taste preferences and the need for healthy foods that taste good

are critical to adolescents, because their food choices are based primarily on taste and appearance, regardless of whether the food is healthy or not (Evans, Wilson, Buck, Torbett, & Williams, 2006; Harrison & Jackson, 2009; McKinley et al., 2005; Skinner et al., 1996; Stevenson et al., 2007; Wise, 2015). Other influencing factors in making unhealthy food choices include physiological and psychological immaturity (Stang et al., 2005) and a heightened sensitivity to peer influence (Sawyer, 2012).

Eating habits among pregnant adolescents do not differ from the general adolescent population, although pregnant adolescents may be motivated to make healthy food choices to promote positive birth outcomes (Montgomery, 2003b). A descriptive survey-based study conducted among 49 pregnant adolescents, ages 15–18 years, in their second or third trimester of pregnancy by Wise and Arcamone (2011) revealed that pregnant adolescents may be concerned enough about the well-being of their babies to eat three meals a day and avoid skipping meals.

Previous research among adolescents suggests that their preferred methods of learning include hands-on cooking in which they can actively participate in food preparation (Bergman, 1997; Evans et al., 2006; Wrieden & Symon, 2003), educational videos (Skinner et al., 1996; Wise, 2015), and picture illustration of foods (Skinner et al., 1996). Croll et al. (2001) reported that nutrition interventions among these adolescents should involve the concept of making healthy eating easy and appealing and the readily perceived short-term benefits apparent. In addition, nutrition education programs for pregnant adolescents should dispel myths associated with healthy eating such as poorly tasting and unappealing healthy foods (McKinley et al., 2005; Stead et al., 2011; Stevenson et al., 2007).

Wrieden and Symon (2003) conducted a 7-week food skills workshop among 10 pregnant adolescents and 6 adult pregnant women. The focus of the workshop was a practical approach to basic and low-cost food choices that met the specific nutritional needs of pregnant adolescents. Because of the problems with low recruitment and retention of study participants, Wrieden and Symon (2003) were unable to assess quantitative changes of the workshop

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intervention on study participants' dietary habits. Wrieden and Symon concluded that an alternative (1-day) method for delivering the nutrition workshop content should be considered to offset problems of recruitment and attrition.

The Higgins Nutrition Intervention Program was developed as an adjunct to routine prenatal care (Higgins, Moxley, Pencharz, Mikolainis, & Dubois, 1989). The purpose of the intervention was to determine whether infant birth weight could be increased and risk for adverse outcomes decreased among pregnant adolescents. The intervention included the systematic application of all the following components: (a) the assessment of pregnant adolescent risk for adverse outcome profiles, (b) an individualized dietary prescription based on specific dietary needs of the adolescent and her nutritional requirements during pregnancy, (c) teaching of food consumption that met dietary requirements with respect to preexisting food habits, and (d) follow-up and supervision by a dietitian at 2-week intervals. There were 1,980 pregnant adolescents, who were experiencing their second pregnancy, who participated in the program. Sibling pairs were examined on the outcome of birth weight. Higgins et al. (1989) reported that differences in birth outcomes between 552 sibling pairs indicated that those infants born while their mothers participated in the program weighed an average of 107 g more than their matched siblings at birth ($p < .01$) after making adjustments for parity and gender.

Long et al. (2002) evaluated increased nutrition knowledge scores among pregnant adolescents who participated in the Great Beginnings program. The program contained six lessons and discussions on nutrition and hands-on activities consistent with the program curriculum. The study was implemented with an experimental group of 136 pregnant teens and parenting teens enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Long et al. reported a significant increase in nutrition knowledge scores in those adolescents who were pregnant and participated in the Great Beginnings program as compared to the control groups ($p \leq .001$) who had not participated in the program.

Because of the staggering number of low birth weight infants born to pregnant adolescents in Camden, New Jersey, Bergman (1997) conducted a nutrition education program called *Break and Learn* to more than 70 pregnant adolescents. The

Break and Learn education program was described as a "break" for adolescents from their usual classes in the high school to learn about nutrition. Lessons included a description of the food pyramid, education about major nutrients and their function, meal planning, emphasizing the importance of a good breakfast and healthy snacks for the adolescent and their babies, information on how to read food labels, and safe food handling. Nineteen participants (61%) achieved substantial weight gains, and there were no weight losses. Twenty-nine participants (93.5%) birthed normal birth weight infants and two participants birthed low birth weight infants (6.5%) compared to the city's rate of 12.7%. Ninety-eight percent of the study participants demonstrated a willingness to change their eating behaviors by taste testing food samples (Bergman, 1997).

A descriptive qualitative study was conducted by Wise (2015) in an effort to better understand effective strategies for nutrition interventions among pregnant adolescents. Participants suggested that the following strategies be considered for nutrition education in the pregnant adolescent population: (a) have a parenting adolescent assist with recruitment using social networking and share tips for choosing and preparing healthy foods, (b) plan a hands-on cooking workshop within a short time frame during the early evening hours to avoid problems with attrition because of childcare and transportation difficulties, (c) actively involve the adolescents in meal preparation using familiar "teen-approved" ingredients, and (d) use some form of social networking such as Facebook and texting to publish upcoming menus and topics for discussion (Wise, 2015). Several of the focus group participants stated that they would attend if they know what they will be eating and what topics will be discussed.

In summary, there is an overall scarcity of research on nutrition education interventions among pregnant adolescents. Interventions reviewed in this article began in the 1980s and the most recently published intervention study for pregnant adolescents was in 2003, and there is little known about the specific nutrition programs developed for the interventions. Specifically, there is an absence of information about the Great Beginnings program by Long et al. (2002) and Higgins Nutrition Intervention Program by Higgins et al. (1989). In addition, most of the studies were limited in their ability to evaluate the program and generalize their findings because of small sample size and attrition.

Notkin-Nielsen et al. (2006) suggested that successful interventions to improve the dietary habits of pregnant teens should include creative ways to influence dietary attitudes, knowledge and behaviors, practical-skill building, mentorship programs, attention to risks for poor dietary intake, and creative recruitment and retention strategies. Investment in such initiatives would return more than the cost of the programs in terms of reduced short- and long-term health complications in both the mother and infant (Notkin-Nielsen et al., 2006). Nutrition programs must also be easily accessible to other researchers who wish to replicate the study. Furthermore, using credible nutrition education resources such as U.S. Department of Agriculture (USDA), Choose MyPlate, and the National Institutes of Health's Guide for Teenagers to develop nutrition intervention content and to obtain recipes would support generalizability of results. Johnson and Moore (2015) suggested that it is also important to recognize and account for potential barriers and enabling factors to the translation of nutrition knowledge into healthy eating behaviors for pregnant adolescents. In addition, there is a lack of rigorous studies that evaluated the independent influence of nutrition education on dietary behaviors and outcomes of pregnant adolescents, and only a few applied a conceptual framework (Notkin-Nielsen et al., 2006).

Finally, a critical element missing from these studies was the complete absence of theoretical frameworks to guide the studies and the nutrition education. Theoretical frameworks are valuable for defining fundamental behavioral objectives, and the dietary beliefs of pregnant adolescents and their use would assist researchers in determining how the objectives could be achieved (Srof & Velsor-Friedrich, 2006). Nutrition interventions based on theoretical models would also add support for self-efficacy, behavioral change, and commitment to action. Hoelscher, Evans, Parcel, and Kelder (2002) asserted that nutrition programs that demonstrate successful outcomes tend to be behaviorally focused and incorporate theoretical frameworks as the foundation for intervention studies. Consequently, there is a need for theoretically based, well-designed nutritional interventions in the pregnant adolescent population.

DEVELOPMENT OF AN INTERACTIVE NUTRITION EDUCATION WORKSHOP

The development of the workshop described in this article was informed by previous studies and recent

literature that identified strategies to be effective in promoting healthy eating habits among pregnant adolescents. The design of the delivery of the workshop and its contents drew heavily on the works of Wise (2015), Wise and Arcamone (2011), Notkin-Nielsen et al. (2006), and Johnson and Moore (2015). Specifically, strategies used for the development of the current nutrition intervention were informed by the findings of Wise (2015) that included tasteful, healthy food choices; age-appropriate interventions that appealed to this population on both cognitive and emotional levels; involvement of peers, because food choices are motivated by societal pressure and image; teaching methods that invited adolescents to participate in the preparation of the meal and view the ingredients first-hand, taste testing, and appropriate incentives.

Theoretical Framework

The initial step in developing the workshop was to identify a theoretical basis to guide its overall development. Pender's health promotion model (HPM) was chosen because it is directed at increasing an individual's level of well-being, explaining disease prevention behavior, and assisting health professionals in identifying factors that influence health behavior (Pender, 2010). Pender's model is a conceptual framework that effectively guides studies that address perceived barriers to action that recognize the individual's perception of roadblocks or personal costs of undertaking a new behavior (Pender, 2010). The model defines inherent characteristics such as individual traits and experiences, behavior-specific cognition and affect, and behavioral outcomes (Pender, 2010).

The HPM addresses behavior-specific variables that enable health professionals to assist individuals in overcoming barriers to lifestyle modifications. The desire for positive birth outcomes may be a motivating factor for pregnant adolescents to modify unhealthy eating behavior and consume healthier foods. This model has been effective in guiding studies that (a) predict health-promoting behavior in adolescents (Allen, Taylor, & Kuiper, 2007; Fowles & Feucht, 2004; Srof & Velsor-Friedrich, 2006), (b) gain insight into how adolescent food choices might be influenced by nutrition education (Fowles & Feucht, 2004; Srof & Velsor-Friedrich, 2006), (c) increase self-efficacy in making healthier food choices among adolescents through nutrition education (Allen et al., 2007), and (d) identify

stressors and motivational influences that prohibit positive health-related behaviors (Allen et al., 2007; Fowles & Feucht, 2004; Srof & Velsor-Friedrich, 2006).

Bandura's definition of self-efficacy also provided guidance in the development of this nutrition program. Bandura defined *self-efficacy* as individuals' personal beliefs in their ability to organize and perform specific actions. Individuals' personal beliefs (personal self-efficacy) determine how they motivate themselves and behave (Bandura, Adams, & Beyer, 1977; Tsang, Hui, & Law, 2012). Furthermore, Bandura asserts that personal self-efficacy is a major determinant of how long individuals will persist in their efforts, or behavioral change. Tsang et al. (2012) noted that there is an abundance of research that indicated that cultivation of self-efficacy among adolescents is critical and enhances the development and performance of skills. High self-efficacy is also associated with better adoption of behavior change (Wingo et al., 2013). For example, self-efficacy in aspects of daily living increases an adolescent's ability to follow through with behavioral changes such as healthy eating (A. Katz, 2011; Walker, Sechrist, & Pender, 1987). An advantage of increased self-efficacy is higher motivation to perform health-promoting behaviors even when obstacles arise (Schulman & Wolfe, 2000). Preventive interventions such as nutrition education can also provide a strong foundation for action and enhancing positive self-efficacy (Catalano et al., 2012) and may prevent unhealthy dieting practices by improving self-esteem (O'Dea & Abraham, 2000). Adolescents who are lacking in self-efficacy may have more difficulty in their ability to make healthy food choices.

A successful interactive nutrition program must consider strengths and limitations of prior studies and consider specific preferences of pregnant adolescents such as taste and appearance of food. In addition, the teaching method should reflect how adolescents want to learn, such as nutrition education videos and teaching by peers, and incentive strategies that serve to promote recruitment and retention must be carefully planned in the development of the intervention. Skill building such as interactive cooking and taste testing of healthy foods may increase personal self-efficacy of healthy eating and is critical to the design of nutrition interventions for pregnant adolescents (Figure 1). Interactive cooking with taste testing of new or unfamiliar foods is an educational strategy that appeals

to adolescents (Bergman, 1997; Evans et al., 2006; Wise, 2015; Wrieden & Symon, 2003).

Subsequently, an interactive cooking workshop (Table 1), developed for pregnant adolescents for a quasi-experimental, repeated measures study, was conducted over a 16-month time span. The workshop was delivered 1 day a week over a 3-week time period (with the exception of one workshop that was delivered in 1 day over 4.5 hours) and was intended to introduce an interactive, pregnant adolescent-focused, peer-centered learning environment for healthy eating education. Each educational presentation incorporated nutrition education videos and interactive demonstrations using MyPlate food models.

Strategies that served to promote skill building included interactive cooking and taste testing of healthy foods, providing healthy recipes, adolescent-friendly cookbooks, and tips from a parenting adolescent who was proactive about healthy eating during her pregnancy. These strategies were incorporated to increase participants' personal self-efficacy of healthy eating and sustain long-term healthy eating behavior and were critical to the aim of this intervention. A nutrition intervention may assist a pregnant adolescent by increasing self-efficacy by identifying and overcoming barriers to healthy eating and increasing nutrition knowledge overall.

Length of Program

Careful consideration was given to the duration of each week's program and to the overall duration of the 3-week workshop. A systematic review of nutrition interventions among pregnant adolescents that spanned 40 years did not identify optimal group sizes for interactive nutrition workshops (Notkin-Nielson et al., 2006). Recommended group sizes were also not addressed by Hoelscher et al. (2002) who reviewed 17 nutrition intervention programs from 1994 to 2000 among school-aged adolescents. Therefore, the rationale for the duration of the weekly sessions and overall duration of the interactive nutrition workshop was based on reports of attrition and retention challenges in previous intervention studies (Bergman, 1997; K. S. Katz et al., 2001; Long et al., 2002; Wrieden & Symon, 2003) and findings from focus group interviews with pregnant adolescents (Wise, 2015). Wrieden and Symon (2003) found that recruitment and retention of pregnant adolescents were challenging because of the 7-week length of their program. Long et al. (2002) presented six lessons for pregnant adolescents

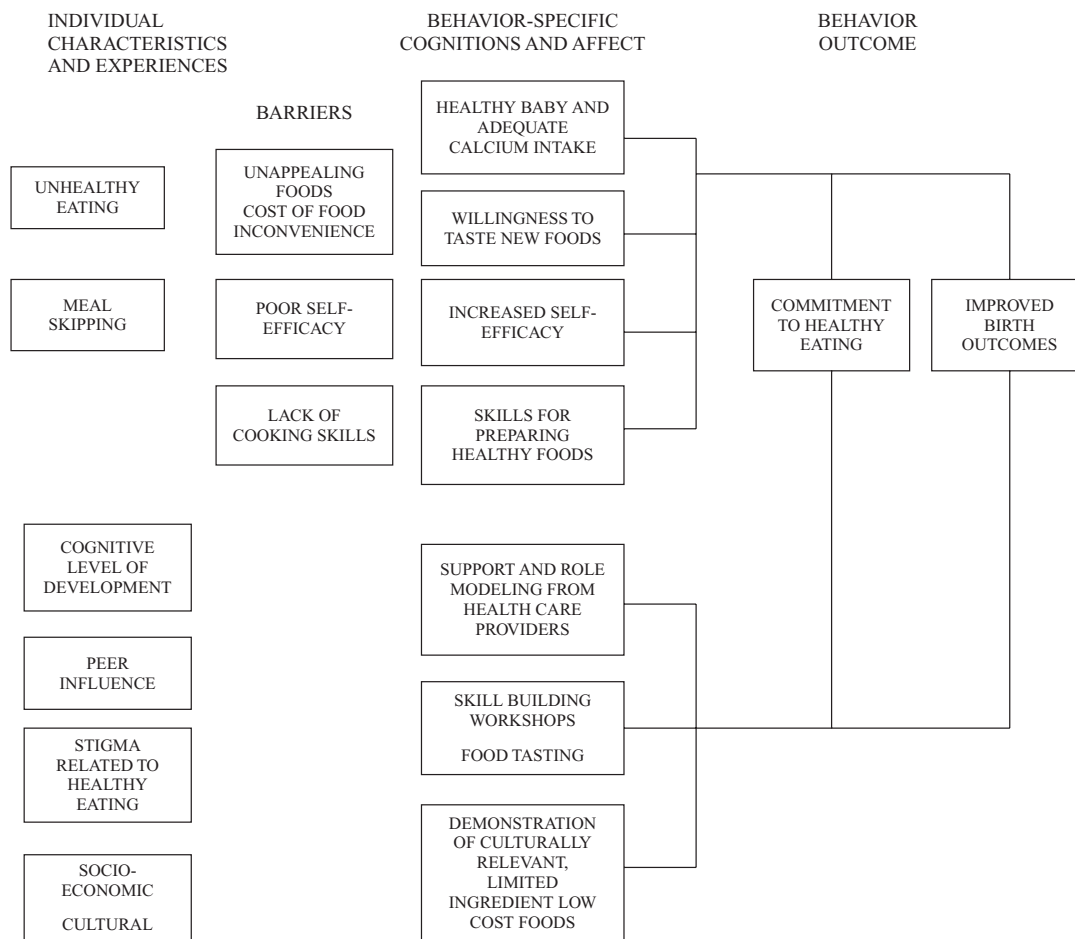


Figure 1. Modified propositions of the health promotion model.

that included nutrition education and hands-on activities. Bergman (1997) presented a 10-week after school nutrition education to pregnant adolescents. However, only 31 of the 70 adolescents completed the program (Bergman, 1997). In addition, findings from focus group interviews among 14 pregnant adolescents also indicated a need for programs of shorter length (Wise, 2015). For this study, a target group size for each workshop session was six to eight participants. This group size allowed time to complete food preparation during each session, encouraged peer interaction while cooking, and permitted individualized mentoring by the research team.

Workshop Content

Easily accessible and trustworthy educational resources provided the foundation for content of this study (see Table 1): USDA, Choose MyPlate, Academy of Nutrition and Dietetics (eatright.org), and the National Institutes of Health's *Take Charge of Your Health: A Guide for Teenagers*. Taste of Home

(tasteofhome.com) was also a resource for easy-to-prepare recipes based on limited ingredients and easy-to-understand directions. Consideration was given to preparing low-cost foods for each workshop session because of the possible potential for low social economic status of study participants.

In addition to using recipes from the websites, menus were created based on results of a qualitative study in which pregnant adolescents listed foods that appeal to them (Wise, 2015). Each week of the workshop integrated content significant to healthy eating among pregnant adolescents such as eating a healthy breakfast and avoiding skipping of meals, consuming adequate calcium during pregnancy, avoiding sugar-sweetened beverages that are calorie-dense but not nutrient-dense, healthy snacking, and creating a meal using ingredients that appeal to pregnant adolescents. Following the weekly cooking demonstrations and while the pregnant adolescents were eating the food they helped to prepare, there was a 20- to 30-minute nutrition education presentation

TABLE 1
Interactive Pregnant Adolescent Nutrition Education Workshop Content

Session 1 Content

Focus: Link between healthy eating and healthy baby benefits such as increasing the likelihood of having a healthy, normal birth weight baby
 Prior to beginning Session 1:

Each participant was given a laminated nutrition facts card that illustrated parts of a food label; a handout that explained in three easy steps how to read a food label; a “For Moms: Eating for a Healthy Baby” handout that emphasized how to build a healthy plate by Choose MyPlate; and a 10-tip handout on being a healthy role model for children.

- “Rethink your drink” (CDC, 2015b) illustrated the amount of sugar and calories in popular beverages. Content was delivered by the dietitian.
 - To reinforce the need for calcium during pregnancy, a short USDA video (Maximizing the Message) on the importance of calcium on developing babies was viewed.
 - Calcium-rich smoothies were prepared and taste tested as an example of a quick, healthy alternative to breakfast (smoothie recipes were retrieved from KidsHealth [2013], Taste of Home, and Meals Matter, Dairy Council of California).
 - Reinforced the need to eat small, frequent meals regularly throughout the day so the baby eats regularly as well and to minimize heartburn and morning sickness rather than skipping breakfast altogether (KidsHealth)
 - Participants received a free baby gift for attending Session 1.
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Session 2

Focus: Healthy snacks and fundamentals of choosing healthy foods such as MyPlate, the food groups, and interpretation of food labels

- Preparation of strawberry oat bars (Taste of Home)
 - Hands-on demonstrations included a colorful, illustrated MyPlate divided into the foods groups, food models, and a variety of empty food package labels for practice with reading and interpreting food labels (Label Ease handout). Content was delivered by a dietitian.
 - Colorful handouts (available in English and Spanish) were distributed to help with reading and interpreting food labels (found at FDA.gov and kidshealth.org).
 - Participants received a free baby gift for attending Session 2.
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Session 3

Focus: Translation of nutrition knowledge into healthy eating behaviors

- Facilitate an understanding of healthy meal planning by reinforcing lessons learned in previous sessions such as meal building and incorporating food groups into each meal.
 - Participants were actively involved with meal planning and preparation, setting the table, serving the food, and clearing the table.
 - An adolescent peer role model served as a guest speaker who shared personal consequences of unhealthy eating during pregnancy and strategies for eating healthy foods during pregnancy.
 - Participants received a free baby gift for attending Session 2.
 - Gift bags were distributed to participants who attended all 3 sessions.
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by a registered nurse or a registered dietitian. In addition, during the second or third session, a parenting adolescent, who had been successful at maintaining a healthy diet during her pregnancy, shared her personal strategies for healthy eating during pregnancy.

To minimize attrition, gift bags were given at the completion of the third session to each participant who attended all 3 weeks. The bags included the following: blenders so the participants could make the breakfast smoothies at home; most but not all of the ingredients for smoothies, strawberry oat bars, and the Chic’ Penne recipes; recipes of the meals made during the workshop; adolescent-friendly cookbooks; and colorful grocery list pads so adolescents can become efficient in grocery shopping for ingredients to prepare meals. In addition, based on a recommendation from a young mom, free baby items

were given to study participants after each week they attended the workshop. She felt the free baby items would be powerful incentives for pregnant adolescents to return the following week, and the workshop team found this to be true.

Session 1

In their study about eating habits among pregnant adolescents, Wise and Arcamone reported that pregnant adolescents may fail to consume adequate milk and other dairy products (Wise & Arcamone, 2011). In this session of the workshop (see Table 1), the focus was on the specific foods in which calcium, vitamin D, and protein can be found and less emphasis was placed on individual nutrients in them. This was based on the findings by Skinner et al. (1996) who reported that adolescents prefer the emphasis to be

on food rather than nutrients. In addition, it was expected that involving the pregnant adolescents in the practice of cooking healthy foods would increase their personal self-efficacy and enable them to eat healthy foods (Grenny, Patterson, Maxfield, McMillan, & Switzler, 2013). According to Grenny et al. (2013), ability is a profound part of motivation. Education content included strategies such as “Rethink your drink” where the participants needed to match the amount of sugar to popular drinks such as chocolate milk, Gatorade, vitamin water, iced tea, and soda. Lastly, taste testing foods made during the interactive nutrition workshop potentially encouraged participants to try healthy foods with unfamiliar ingredients that they may have been unwilling to try previously.

Session 2

Session 2 continued to reinforce the importance of healthy eating during pregnancy to promote fetal growth and development. During Session 2 (see Table 1), participants assisted in preparing a healthy strawberry oat bar recipe. In addition, participants were encouraged to taste various kinds of yogurt such as original and Greek-style yogurt. Choose MyPlate education materials and food models were also used each week to facilitate learning. During this session, a plastic Choose MyPlate plate was used to demonstrate how to build a healthy meal using all food groups.

Session 3

It is important to recognize enabling factors that assist pregnant adolescents in the translation of nutrition knowledge into healthy eating behaviors. Based on Pender’s (2010) HPM constructs study, participants are more likely to commit to healthy eating behavior when they perceive benefits (e.g., healthy baby) and obtain the necessary skills and support to sustain healthy eating behaviors. Through actively involving participants in meal preparation (see Table 1), the research team anticipated that Session 3 would positively influence study participants’ personal self-efficacy and help reduce barriers such as perceived lack of skills or confidence in their ability to choose and prepare healthy meals.

Workshop Procedures

Participants in each workshop were divided into subgroups of two to three participants and assigned to a team member who designated specific cooking tasks intended to develop cooking skills. The featured recipe or recipes for that workshop session

was read and explained in detail prior to the start of food preparation. Each recipe had 10 or fewer ingredients. Strict handwashing was enforced throughout each workshop to lessen the risk of bacterial contamination of food ingredients.

After the first workshop, it became evident that despite participants’ assertions that they cooked at home, very few of the participants understood the recipes. In addition, they lacked overall knowledge of standard measurements and were not able to effectively use measurement cups and spoons without individual mentoring. For example, they were unable to add measurements together such as $\frac{1}{4}$ cup + $\frac{1}{4}$ cup and determine the total amount and did not understand the difference between a teaspoon and tablespoon. In addition, it was noted that participants did not understand that measuring cups should be filled to the top; therefore, basic skills were taught such as filling measuring cups and spoons, cutting foods such as fruit and chicken, safety with cutting boards, knives and blenders, and boiling water and cooking times.

The food preparation tasks were rotated among participants during each session to ensure ample opportunity for interactive hands-on learning. To maximize the time available, some tasks were completed by the research team prior to the workshop sessions such as getting the water for pasta ready to boil and setting up all the food prep stations. All excess food items and snacks were offered to participants to take home and share with their family.

The incentive gift bags given at Session 3 to all participants who attended every session was found to be a significant incentive for the participants. The bags were so significant that two participants “made up” a missed session in a later workshop cohort so they were able to receive the bag. The free baby items were also appreciated, and participants were able to choose items that they needed such as baby wipes and baby blankets.

Peer-to-Peer Education

Peers role models, who were young mothers who shared their own experiences about eating healthy and its importance, were part of the workshop program. These young mothers were given a stipend of \$25 for their participation in the workshop. Two of

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these young mothers conveyed a powerful message about developing dental caries because of lack of calcium during pregnancy; another had developed gestational diabetes and shared the importance of eliminating junk food. Another peer role model was a parent educator from a parenting program in the mid-Atlantic region and a former adolescent mother who understood the challenges that adolescent mothers experience.

RECOMMENDATIONS FOR HEALTH-CARE PROVIDERS

Nutritional counseling remains a focus in the prenatal care for these young women. Yet, the adolescent population presents unique challenges to maternal–child health-care professionals (HCPs) because of the various environmental and developmental factors that influence their adolescent decision making especially their indifference to healthy eating. The nutrition component of standard prenatal care may not be sufficient to encourage dietary change in the pregnant adolescent population (Story et al., 2002). It is important for HCPs to be aware that pregnant adolescents are willing to adopt healthy eating habits while pregnant (Wise, 2015; Wise & Arcamone, 2011). If pregnant adolescents perceive that healthy eating is immediately beneficial to the health of their baby and they are confident in their ability to choose and prepare healthy foods, they are more likely to modify their unhealthy eating habits.

Investment into developing relationships with pregnant adolescents is critical because HCPs can be important role models. HCPs who care for pregnant adolescents are in an ideal position to offer resources to this population and to encourage them to attend nutrition education programs. According to Wise (2015), pregnant adolescents are likely to attend nutrition programs if they are invited by people they know and trust. Therefore, it is critical that HCPs cultivate relationships with pregnant adolescents and encourage them to attend nutrition programs. HCPs can also direct pregnant adolescents to resources such as Choose MyPlate, USDA, and Kids Eat Right for nutrition education information, free printable materials, healthy food tips and recipes, and quick links to the Special Supplemental Program for WIC program (Wise, 2015). Based on experiences in the current program, the following recommendation can be made: Maximum length for each *interactive* workshop session is 2 hours because

of the short attention span of pregnant adolescents and an inability to stand and sit for extended time.

CONCLUSION

The pregnant adolescent population presents unique challenges in which to change high-risk lifestyle behaviors, such as unhealthy eating, to improve to childbirth outcomes. This article describes a developmentally and age-appropriate, theoretically based (see Figure 1), and evidence-based nutrition education program for this clinical population. It also emphasizes health professionals' essential role in positively influencing health behaviors for these pregnant adolescents by providing education and practical examples of healthy eating.

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NANCY J. WISE is an assistant professor at Eastern Mennonite University, Lancaster, Pennsylvania. Her area of research focuses on pregnant adolescent nutrition. MARY ANN CANTRELL is a professor in the College of Nursing, Villanova University, Pennsylvania. Her area of research focuses on health-related outcomes among adolescent oncology patients and young adult childhood survivors. FRANCES HADLEY is currently working as a clinical dietitian for WellSpan Health system. KIMBERLY JOYCE is a long-term care supervisor and a staff nurse at QuickCare WellSpan Health systems.