

Executive Summary

The WIC Nutrition Education Assessment Study was conducted by Abt Associates Inc. of Cambridge, Massachusetts, under contract with the Food and Nutrition Service (FNS) of the United States Department of Agriculture (USDA). The study was designed by FNS to fill several important gaps in information about the nutrition education component of the WIC Program. It was not designed to be a "best practices" study, nor was it meant to provide a nationally representative picture of nutrition education in the WIC Program. Rather, the study was exploratory in nature and examined processes and outcomes in six local WIC agencies that serve different populations and use a variety of different approaches to providing nutrition education. Findings from the study are intended to provide a focus for future research in this area.

The study is unique in that it used a longitudinal design, i.e., repeated measures from the same group of WIC participants over a period of time. In addition, the study employed a mixed-method approach to data collection that allowed for collection of comparable data from different sources. This feature provides broad coverage of important issues from different perspectives.

Six local WIC agencies participated in the study which focused on pregnant and postpartum WIC participants. A separate report describes the nutrition-related knowledge, attitudes, and behaviors of study subjects at the time they enrolled in WIC (Fox, M.K., et al., 1998). This report describes the nutrition education services offered in study sites, participants' receipt of and satisfaction with these services, and changes in participants' knowledge, attitudes, and behaviors between the time of prenatal WIC certification and four-to-six-months postpartum.

Overview of the Study

The study had four key research objectives:

- To assess pregnant women's nutrition-related knowledge, attitudes, and self-reported behaviors at the time of WIC enrollment.
- To describe the processes used by local agencies in delivering WIC nutrition education to pregnant and postpartum women and the type and amount of nutrition education actually received by these participants.
- To assess participants' satisfaction with WIC nutrition education services, materials, and staff.
- To the extent possible, to assess the impact of WIC nutrition education on participants' knowledge, attitudes, and behaviors.

The impact study encompassed in the study's fourth objective was exploratory in nature. Because program policies precluded establishment of a true control group, i.e., a group of WIC participants to whom WIC nutrition education services were not offered, a quasi-experimental design was used.

Although the design does not permit a definitive assessment of the impact of WIC nutrition education, nor yield results that are generalizable to the WIC population nationwide, the study does provide useful insights about the potential magnitude and direction of changes in participants' knowledge, attitudes, and behaviors over time. Moreover, because the demographic characteristics of the study sample were quite similar to those of pregnant WIC participants nationwide, study findings have broad relevance for the WIC Program.

Participating Local Agencies

Six local agencies, located in three different States (two agencies per State), participated in the study. Sites were purposefully selected to include a variety of approaches to the delivery of WIC nutrition education, as well variability in community type (urban *versus* rural) and ethnic and cultural backgrounds of WIC participants.

Sample Recruitment

Newly enrolling pregnant women were recruited into the study just prior to WIC certification. A newly enrolling pregnant woman, while just being certified for her current pregnancy, may have participated in WIC during previous pregnancies and/or as caretaker of an infant or child WIC participant. To ensure that baseline information was collected before women received any nutrition education for their current pregnancy, recruitment and baseline interviews were completed *before* women met with any WIC staff.

Data Collection

Sample members were interviewed three times. The baseline survey was completed at the time of prenatal WIC certification. The first follow-up survey (prenatal survey) was completed at 32-36 weeks gestation and the second (postpartum survey) was completed four to six months postpartum. Identical measures of nutrition knowledge, attitudes, and behavior were included in all three surveys. Follow-up surveys also included questions about experiences and satisfaction with WIC nutrition education.

In addition, data were abstracted from WIC records to ascertain the number and type of nutrition education contacts provided to study respondents during prenatal and postpartum certification periods. Finally, to supplement background information provided by local agency directors and obtain a "real world" picture of WIC nutrition education, a limited number of nutrition education contacts were observed in each site.

Key Findings

Characteristics of Nutrition Education Offered in Study Sites

- Methods used to deliver nutrition education varied considerably across sites, including use of individualized counseling for all nutrition education contacts and use of a newsletter (distributed by voucher clerks) for follow-up contacts with low-risk women.
- Four of the six study sites experienced problems with participant no-shows for follow-up contacts. The problem was quite significant in two sites, so much so that local agency directors ultimately implemented procedures specifically designed to ensure that participants receive a second prenatal contact.
- A majority of sample members were certified for postpartum participation. Most certified during the six-week transition period allowed after the birth of the baby. The proportion of women who did *not* recertify in one site was notably higher than the other sites. This may be because women were required to attend separate certification appointments for themselves and their infants. The five other sites used joint appointments that allowed both certifications to be completed at the same time.
- The quality of staff/participant interactions was generally quite high. WIC nutrition educators did an excellent job of addressing participants' questions or concerns in a supportive manner; providing opportunity for questions; offering specific and appropriate ideas on how to implement recommended behaviors (e.g., ways to increase milk consumption other than drinking milk as a beverage); maintaining nonjudgmental attitudes; and providing positive feedback on current dietary intake (i.e., highlighting positive aspects of participants' current behaviors before discussing needed improvements).
- At the same time, staff in five of the six sites frequently did not assess participants' understanding of the information being communicated or attempt to determine whether there were barriers that might affect a participant's ability to adopt a recommended behavior. Staff in four of the six sites often did not ask about participants' willingness to make a recommended behavior change. And, in three sites, WIC staff tended to assign, rather than negotiate, goals for behavior change. Use of group contacts (classes) did not preclude these desirable interactions, nor did use of individual contacts ensure them.
- With one exception, the physical environment in which nutrition education was delivered was appropriate and comfortable.

- The topics covered in WIC nutrition education contacts were generally consistent with expectations. Most of the concepts included in the nutrition knowledge measure developed for this study received widespread or moderate coverage. Certification contacts tended to cover a broad array of topics, with an emphasis on content of the WIC food package and, for prenatal certifications, recommended eating practices during pregnancy. Follow-up contacts tended to focus on a single or more limited number of concepts. In follow-up prenatal contacts, the most frequent topic was recommended weight gain during pregnancy.
- Referrals to health and social services were relatively rare. Because referrals are supposed to be tailored to the individual needs of a participant, the absence of a referral does not necessarily imply that a needed referral was missed. The data suggest that the number and type of referrals offered in local WIC agencies is more reflective of the context or local environment in which programs operate, i.e., the extent to which participants are already hooked into needed programs and services before entry into WIC, than of the quality of nutrition education offered to program participants.

Participants' Receipt of Nutrition Education Contacts

- According to data from WIC administrative records, a majority of respondents (80-97% across all study sites) had the opportunity to receive two nutrition education contacts between prenatal certification and the birth of their babies. The extent to which this goal was achieved varied across sites, and the pattern observed was entirely consistent with findings from on-site observations of nutrition education contacts. The percentage of women in each site who received two contacts during the prenatal period ranged from a high of 92 percent to a low of 24 percent.
- The two sites that were most successful in providing two prenatal contacts used tri-monthly voucher issuance which, in theory, decreases the number of contact opportunities. No-show rates for follow-up nutrition education contacts were substantially lower in these two sites, as reported by local agency directors and documented during on-site observations.
- Although virtually all study subjects had the opportunity to receive two nutrition education contacts between postpartum certification and the time WIC record abstract data were collected (approximately six months postpartum), a large proportion received only one contact (the certification contact). The maximum percentage for receipt of two nutrition education contacts was 59 percent. The minimum was five percent.
- Respondent self-reports regarding information and advice received from WIC staff were largely consistent with findings from on-site observations. In general, topics that

received widespread coverage in the on-site observations were reported frequently and topics that received less coverage were reported less frequently.

- Respondents reported few referrals from WIC staff. This finding is consistent with the on-site observations. Because most study sites did not record information about referrals in WIC records, it was not possible to cross-check participant self-reports with administrative data.
- The following types of women were significantly less likely to receive a second prenatal contact: women who had previously been pregnant but not enrolled in WIC; women who enrolled in their third trimester; and women who smoked. The following types of women were significantly more likely to receive a second prenatal contact: previous WIC participants; women with higher overall nutrition knowledge scores at baseline; women who reported regular use of prenatal vitamins; and women who were planning to breastfeed for at least six months at the time of WIC enrollment.
- These data suggest that the women most likely to return for follow-up prenatal nutrition education contacts are those who already have higher levels of nutrition knowledge and, to some extent, already exhibit desirable health behaviors. Conversely, women who are theoretically most in need of services, e.g., those who enroll late in pregnancy and those who smoke, are less likely to return for a second prenatal contact.

Changes in Knowledge, Attitudes, and Behaviors Over Time

Nutrition Knowledge

- With the exception of one site that served a large population of recent immigrants, participants entered WIC with reasonably high levels of nutrition knowledge. Overall knowledge scores increased significantly in all sites between the baseline and prenatal surveys. Gains persisted through the postpartum survey and, in most sites, actually increased by a modest amount.
- The content areas that showed the greatest improvement were knowledge related to breastfeeding and knowledge related to recommended infant feeding practices. Mean scores for two other two content areas (general nutrition knowledge and healthy practices during pregnancy) also improved, however, changes were less substantial and did not always reach statistical significance. Overall, the pattern of change seen in these data is consistent with the notion that WIC nutrition education is effective in communicating key nutrition concepts to program participants. The two content areas in which gains were most substantial (breastfeeding and recommended infant feeding practices) were those in which women showed lower levels of baseline knowledge *and*

which on-site observations and participant self-reports showed to be well covered in WIC nutrition education contacts.

- In five of the six study sites, women who participated in WIC during a previous pregnancy had significantly higher baseline knowledge scores than women with no prior WIC experience. These differences were largely attributable to differences in scores for breastfeeding knowledge (three sites) and knowledge about recommended infant feeding practices (five sites) — the two content areas that showed the most substantial gain in this study. This finding suggests that at least some of the gains in nutrition knowledge described in the preceding section may be attributable to WIC nutrition education.

Attitudes and Perceptions

- Five measures of nutrition-related attitudes and perceptions were included in the study. In general, changes over time, although statistically significant, were numerically small. The practical significance of these small changes is unclear. The general pattern observed in the data was no change to a modest improvement in attitudes and perceptions during the prenatal period followed by a decline during the postpartum period. Postpartum scores generally approximated or were less than baseline scores.
- Infant feeding preference scores (a measure of a woman's relative openness to breastfeeding) improved in four of the six study sites between the baseline and prenatal surveys. Nonetheless, the percentage of women who actually initiated breastfeeding was not significantly different from the percentage who entered the WIC Program already intending to breastfeed.

Nutrition-related Behaviors

- With one exception, use of prenatal vitamins and iron supplements increased significantly between the baseline survey and the prenatal survey.
- Reported daily consumption of milk, 100% fruit juice, and WIC cereals increased significantly in all six study sites between the baseline and prenatal surveys. Reported consumption of cheese, as well as peanut butter and dried beans, peas, and lentils, increased in four sites. Reported consumption of eggs increased in three sites. Only the increased consumption of WIC cereals was maintained into the postpartum period. Differences in the composition of food packages provided to prenatal and postpartum participants may contribute to differences in reported consumption of WIC foods.
- Most women followed recommended infant feeding guidelines during the earliest months of life, however, some women offered their infants inappropriate fluids (primarily

sweetened water) or solids (primarily infant cereal) before the age of two months. The percentage of women who offered inappropriate fluids before two months of age ranged from a low of five percent to a high of 27 percent. The percentage who offered solid foods before two months ranged from three percent to 18 percent.

- The prevalence of undesirable infant feeding practices increased sharply for older infants. More than 40 percent of women in each site offered their babies something other than breastmilk, formula, or plain water before the age of 4 months. In several sites, two-thirds to three-quarters of the respondents reported this behavior. Use of solids (primarily infant cereal) before 4 months of age was also a common practice (minimum of 39 percent and a maximum of 67 percent). In all but one site, roughly one-third of the respondents offered their infants something that is considered completely inappropriate for infants of any age (e.g., cows' milk, fruit drinks, sodas, or desserts) or not appropriate until at least 6 months of age (e.g., fruits or vegetables, meats, or whole eggs).

Other Behaviors

- Many women who smoked cigarettes prior to pregnancy reportedly quit after becoming aware of their pregnancy and before enrolling in WIC. Nonetheless, in all but one site (where very few women smoked even before pregnancy), 20 to 41 percent of women reported using cigarettes at the time of the baseline survey. At the time of the prenatal survey, the prevalence of cigarette use was significantly lower in two of these five sites.
- A majority of women who stopped smoking before or after WIC certification resumed the habit by the time of the postpartum survey. In all six sites, the percentage of women using cigarettes at the time of the postpartum survey was significantly greater than at baseline. Although cigarette use had not returned to pre-pregnancy levels, there was a definite trend in this direction.
- Most women who used alcohol prior to pregnancy reportedly discontinued this practice prior to WIC certification. With one exception, fewer than ten percent of women reported use of alcohol at the time of the baseline interview. Over the course of prenatal WIC participation, use of alcohol decreased further (and significantly) in two sites. In the other four sites, the value of the estimates shifted somewhat, sometimes up and sometimes down, but the differences were not statistically significant.

By the time of the postpartum survey, many women had resumed use of alcohol. In all six sites, the percentage of respondents who reported use of alcohol during the postpartum period was significantly greater than at baseline but still substantially lower than prior to pregnancy.

- More than 70 percent of respondents in each site entered WIC already following the recommendation that over-the-counter medications should be taken only with physician approval. Nonetheless, adherence to the recommendation increased significantly in all sites between the baseline and prenatal surveys, reaching levels of 82 to 97 percent.

Participants' Satisfaction with WIC Nutrition Education

- Virtually all respondents reported receiving written nutrition education materials. At the time of the prenatal survey, three-quarters or more of the respondents in each site reported reading all or most of the materials provided. Another ten to 23 percent of respondents reported reading some of the written materials. Two percent or less of the respondents indicated that they did not read any of the materials. The overall pattern of responses was similar for the postpartum survey data.
- Women who reported reading at least some of the written materials provided by WIC were asked to rate the relative usefulness of the materials. More than half of the prenatal survey respondents in each site rated the written materials as either extremely useful or useful. With one exception, roughly a third of the respondents in each site found written materials to be only somewhat useful and a small percentage (2-3%) judged the materials to be not very useful or useless. Again, the overall pattern of responses was similar for the postpartum survey data.
- More than 60 percent of prenatal survey respondents who attended a nutrition education class rated the class(es) as either very interesting or interesting. Postpartum assessments were somewhat more positive in two sites and somewhat more negative in three sites.
- With one exception (the site with a large population of recent immigrants), five percent or less of the respondents reported that they had questions or concerns that had not been addressed by WIC staff. In the site with the large immigrant population, the percentage of women who reported an unmet information need at the time of the prenatal survey (12%) was more than twice that of any other site. By the time of the postpartum survey, the prevalence of this problem had dropped considerably and was comparable to other study sites. This pattern suggests that language and/or cultural barriers may have complicated, but did not impede, communication of nutrition education messages in this site.
- Participants were asked directly whether they learned anything from WIC ("Did you learn anything that you did not know before you visited the WIC Program?"). In most sites, less than half of the prenatal survey sample responded affirmatively. Results for the postpartum survey were similar.

- Respondents who reported learning something from WIC were asked to identify what was learned. Responses were consistent with findings regarding topics covered in WIC nutrition education. The topic areas in which most respondents reported knowledge gain were recommended eating practices during pregnancy and breastfeeding.
- Respondents' self-reports about knowledge gain also corresponded well with changes in both nutrition knowledge scores and infant feeding preference scores. Although knowledge scores increased significantly over time for both self-described learners and non-learners, respondents who said they learned something from WIC (self-described learners) gained significantly more knowledge than respondents who said they did *not* learn anything from WIC (self-described non-learners). Mean overall knowledge scores for self-described learners increased 6.8 percentage points between baseline and prenatal surveys, compared to 4.5 percentage points for self-described non-learners. Likewise, between the baseline and postpartum surveys, overall knowledge scores increased 8.8 points for self-described learners compared to 6.3 percentage points for self-described non-learners. A similar pattern was noted for the infant feeding preference score.
- These data indicate that both learners and non-learners increased their nutrition knowledge over the course of the study. The fact that participants who reported learning something from WIC showed significantly greater gains in knowledge than participants who said they did not learn anything from WIC suggests that, for these participants, at least some of the knowledge gain realized over time is attributable to WIC nutrition education.
- Respondents were asked to identify up to three things they liked about the WIC Program and up to three things they disliked. WIC supplemental foods ranked as the leading positive program attribute in all six sites in both prenatal and postpartum surveys. This was the only program characteristic that was consistently included in the top three positive aspects of the WIC Program.
- The next most frequently cited positive feature, included among the top three in four of the six sites, was that the WIC Program/WIC staff care(s) about participants. An argument can easily be made that the nutrition education component of the program plays a role in generating this perception. Other program characteristics that vied for third place on the top-three list for all sites combined included "learn about healthy eating," "talking to the nutritionist," and "talking with other WIC staff." All three of these features are clearly related to the nutrition education component of the WIC Program.

- Respondents in most sites found it more difficult to identify unfavorable aspects of the WIC Program than favorable aspects. With one exception, more than two-thirds of the prenatal respondents and more than half of the postpartum respondents were unable to identify anything they did not like about WIC.
- Respondents were asked to provide specific suggestions for improving WIC nutrition education, however, relatively few respondents were able to offer specific suggestions. In the prenatal survey, suggestions were offered by four to 15 percent of respondents. The range for the postpartum survey was three to 19 percent. Among respondents who did offer suggestions, recommendations most often related to improving the content and/or delivery of nutrition education. Specific recommendations included increasing the amount of individualized contact and increasing participants' awareness of, or opportunities for, nutrition education.
- Responses to a battery of items designed to assess program satisfaction indicate that, overall, the vast majority of respondents in all six study sites were quite satisfied with WIC nutrition education. In five of the six sites, more than 90 percent of prenatal and postpartum respondents found WIC staff to be helpful as well as warm and friendly; believed that WIC staff respected them as individuals; found explanations offered by WIC staff to be readily understandable; had their questions answered; felt satisfied when they left the WIC clinic; and found the information offered to be helpful. Likewise, more than 90 percent of respondents in five of six sites, did *not* feel confused when they left the WIC clinic.
- Although the overall picture of participant satisfaction was highly positive, respondents did identify some areas of dissatisfaction. Five to 37 percent of respondents reported a concern about the waiting time at WIC clinics (agreed or strongly agreed with the statement "The staff made me wait too long"). The percentage of respondents who said they had to wait too long increased between the prenatal survey and the postpartum survey in five of the six study sites.
- Another area of dissatisfaction was the fact that some of the information and guidance provided by WIC staff conflicted with information provided by physicians (agreed or strongly agreed with the statement "Some of the advice I received contradicted what my doctor told me"). At the time of the prenatal survey, the percentage of respondents reporting such conflicts, ranged from 15 to 24 percent. Contradictory advice most often involved advice related to weight gain during pregnancy; the need for iron supplements (i.e., whether or not a respondent was anemic); and breastfeeding.
- The prevalence of contradictory advice from physicians increased in the postpartum survey (range from 24% to 47%). Conflicts during the postpartum period most often

involved breastfeeding — with WIC staff encouraging breastfeeding and local physicians either downplaying or actually discouraging breastfeeding.

- Analyses that explored relationships between overall satisfaction (a composite measure), individual measures of satisfaction, and participants' experiences with WIC nutrition education revealed that characteristics of women's nutrition education experiences may influence their overall level of satisfaction with the WIC Program. The following types of self-reported experiences were associated with significantly higher levels of overall satisfaction: strongly agreed that counselors helped in decision about how to feed the baby; strongly *disagreed* that WIC staff made them wait too long; strongly *disagreed* that advice given by WIC staff was contradictory to advice given by physician; thought written nutrition education materials were useful or very useful; and did not have any outstanding issues/questions to discuss with a nutritionist. In addition, two factors—*not* having been referred to health or social services and *not* learning anything new from WIC—were associated with slightly lower levels of overall satisfaction.