

**Evaluation of the Massachusetts WIC Program's  
Getting to the Heart of the Matter (GHM)  
Pilot Study**

***Pre- and Post-Test Findings***

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## **Evaluation of the Massachusetts WIC Program Getting to the Heart of the Matter Pilot Study**

### **PRINCIPAL INVESTIGATOR**

Karen E. Peterson, ScD  
Professor and Director, Human Nutrition Program  
Department of Environmental Health Sciences  
University of Michigan School of Public Health

Adjunct Associate Professor  
Department of Nutrition, Harvard School of Public Health

### **CO-PRINCIPAL INVESTIGATOR**

Ana C. Lindsay, MPH, DDS, DrPH  
Senior Research Scientist  
Department of Nutrition  
Harvard School of Public Health

### **EVALUATION COORDINATOR**

Monica L. Wang, MS  
Department of Society, Human Development and Health  
Harvard School of Public Health

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## **Introduction**

The Massachusetts Getting to the Heart of the Matter (GHM) study is a project designed to develop and improve client-provider communication, parental self-efficacy and connectedness to the WIC program among WIC staff and participants. The GHM project trained staff in emotion-based techniques for conducting nutrition assessment, building upon techniques developed for nutrition counseling through the Massachusetts WIC Program's Touching Hearts Touching Minds (THTM) project. The GHM emotion-based approach is a novel method for implementing USDA's Value Enhanced Nutrition Assessment (VENA) in local WIC programs.

VENA is a new initiative developed jointly by the Food and Nutrition Service (FNS) and the National WIC Association (NWA) in 2008 to provide comprehensive WIC nutrition assessment to its participants (FNS & USDA, 2008). The primary goal of VENA is to go beyond the initial purpose of nutrition assessment to determine WIC Program eligibility (e.g., assign nutrition-risk criteria), in order to improve nutrition education for participants. Thus, VENA is designed to enhance assessment standards and to tailor nutrition education, referrals, and food packages through a participant-centered model. WIC providers are trained through VENA to gather more relevant information from participants during the assessment process and to adapt the program to address emerging health-related risks and the changing needs of participants (FNS & USDA, 2008). Most importantly, VENA is an opportunity to build rapport and trust between WIC providers and WIC participants, leading to open conversations that facilitate behavior change and improved health outcomes among WIC participants (Kallio et al., 2007).

Similar to VENA, the MA Touching Hearts Touching Minds (THTM) project focused on transforming nutrition education services, through a USDA Special Grants award to the Massachusetts Department of Public Health (MDPH) WIC Program (Colchamiro, et al.,

2010). Using emotion-based techniques to target participants' underlying motivational drivers, THTM sought to promote behavior change among WIC participants (McCarthy et al., 2008). In emotion-based counseling, individuals are first motivated to change through feelings and are then given practical information to act upon. The THTM project's emotion-based messages utilizes this approach to "touch hearts first, and then minds" (McCarthy et al., 2008). In contrast to a one-way conversation in which the WIC provider offers nutrition education and tips, emotion-based counseling resembles an open, comfortable, and interactive conversation designed to 'get to the heart' of parents' concerns (McCarthy et al., 2008). Examples of emotion-based techniques include: using engaging questions that focus on parents' feelings, using a conversational tone, sharing sustained eye contact and providing nutrition education messages that are directly linked to an individual's "emotional pulse points" (Colchamiro et al., 2010).

The Massachusetts WIC Program launched the GHM project after receiving funding from a USDA WIC Special Projects planning grant in FY 2006 and a three-year grant in 2007: Getting to the Heart of the Matter (GHM): Using Emotion-based Techniques to Implement VENA in Massachusetts WIC. Funds from the WIC Special Projects Grant were used to hire researchers (Pam McCarthy & Associates, Inc.) to conduct formative, ethnographic research on a small sample of WIC participants prior to the start of the intervention. The purpose of the ethnographic research was to identify potential barriers and facilitators to successful assessment as it relates to counseling in the WIC setting and to guide the development of the GHM staff training and the intervention itself. In May of 2008, researchers from the Harvard School of Public Health began an evaluation of the GHM study in collaboration with MDPH. The GHM evaluation was conducted through a collaborative research partnership between the Harvard School of Public Health (HSPH) and the Massachusetts Department of Public Health (MDPH). The organization and

implementation of evaluation activities included monthly conference calls and/or meetings of the HSPH and MDPH investigators.

### **Development of GHM Nutrition Assessment Intervention**

The WIC setting has previously been used as a venue for influencing behavior (Whitaker et al., 2004; Serrano et al., 2006, Chamberlin et al., 2002; Whaley et al., 2010; Ritchie et al., 2010). The two main issues emerging from the literature on WIC-specific interventions include: (1) obstacles in facilitating client behavior change; and (2) lack of cultural consideration. WIC clients and staff both report obstacles in addressing childhood overweight in the client-provider setting. A quasi-experimental study of six WIC sites in California conducted by Crawford and colleagues (2004) found that WIC staff reported hesitance in talking to WIC mothers about their children's weight and were concerned with the effectiveness of nutritional counseling and assessment. Similar results were found in a study by Serrano et al. where WIC staff reported a lack of confidence and practice in preventing childhood overweight with WIC participants (2006).

From a client perspective, ethnographic research in Massachusetts has shown that WIC participants often reported feeling confused and overwhelmed with the large amount of nutritional information presented during nutritional assessment and counseling sessions (McCarthy, 2008). In other studies, participants also voiced a need for their WIC counselor be a resource person or a health mentor whom they can feel comfortable approaching and talking with (McGarvey et al., 2006) as opposed to a professional who is perceived as critical or "nagging" (Ebbeling et al., 2006, Whitaker et al., 2004). Actively engaging participants in discussion and inquiring about their own nutrition goals may allow for better understanding of how participants' decisions are driven by complex, underlying emotions and motivations (Resnicow & Vaughan, 2006). This process may aid WIC

counselors in successfully tailoring nutrition services that ultimately lead to more persistent changes in client health behavior.

Researchers also have called for more culturally-specific interventions when targeting obesity in the WIC setting. A study of WIC participants in New York City emphasized the need for interventions addressing childhood overweight to target younger children and to be culturally specific (Nelson et al., 2004). In this study, two-year-olds were less likely to be overweight than 3- and 4-year-olds, and Hispanic children were more than twice as likely to be overweight or at risk for overweight compared to children of other racial/ethnic backgrounds. Crawford and colleagues (2004) have suggested that standard strategies guiding WIC counseling, particularly assessment, may not be as effective and/or appropriate for participants of certain racial/ethnic groups due to the assumption of a shared conception of 'risk', the recognition of a 'problem' that needs solving, and the narrow range of solutions provided. (Deehy et al., 2010; Lindsay et al., 2008)

Findings from published studies highlight the need to enhance the WIC nutrition assessment and counseling process through greater client-provider engagement incorporating cultural awareness. Staff training, health promotion programs, and culturally relevant educational materials are warranted for WIC staff to build a strong knowledge base and promote self-efficacy about childhood overweight-related topics (Serrano et al., 2006). To our knowledge, one study to date has examined communication between WIC providers and WIC mothers of young children. Using a pre-test post-test evaluation design, Newes-Adeyi and colleagues (2004) found an increase in WIC staff's level of engagement with their clients and in their counseling self-efficacy after undergoing a one-day intensive training program designed to improve counseling skills of WIC providers. However, this study was limited by its lack of a comparison group and did not measure clients' perceptions of the nutrition assessment experience. The evaluation of the GHM Nutrition

Assessment Intervention addresses such limitations by incorporating a quasi-experimental design including control sites in pre-test and post-test measurement time points, augmented by a mixed methods approach providing an independent, post-test qualitative study of experiences of WIC participants and WIC staff in GHM Pilot Intervention sites.

## Evaluation Design

### *Overview*

The GHM project emphasizes fostering a genuine connection between the WIC participant and counselor that allows for better communication and understanding of the client's concerns. Ultimately, GHM is designed to develop participant-driven, emotion-based nutrition assessment tools and strategies that resonate with both WIC participants and staff and that can be utilized across a variety of WIC clinics and populations (Kallio et al., 2007). Findings from the ethnographic report by McCarthy & Associates were used to guide the GHM intervention and provided the basis for development and selection of many survey items.

The GHM intervention and evaluation were conducted over a three-year period (See Appendix 1). Year 1 of the GHM study included conducting ethnographic research and focus groups to inform the GHM intervention as well as administering pre-intervention surveys to WIC participants and staff at intervention and control sites. Year 2 of the study consisted of staff implementation of the emotion-based assessment tools and techniques at intervention sites. The GHM intervention consisted of a two-day staff training in which nutrition staff at WIC sites were taught to apply emotion-based techniques to their nutrition assessment. Intervention sites were set to implement these training tools and materials in their WIC nutrition assessments for the duration of approximately 16 months.

Year 3 activities included administering the post-intervention surveys and conducting focus groups with WIC participants and in-depth interviews with staff that were purposively sampled from GHM Intervention sites. Ethnographic research subsequently was conducted by McCarthy and Associates in order to finalize the emotion-based tools and strategies before distributing the training and materials to Massachusetts WIC nutrition educators and online through the USDA's WIC Works Resource System.

The GHM evaluation follows a multi-site, quasi-experimental design assessing Intervention and Control sites at pre-test and post-test, augmented by a mixed methods approach providing a post-test qualitative study including focus groups with WIC participants and in-depth interviews with WIC staff in GHM Pilot Intervention sites. The MDPH State WIC Program Senior Staff selected six MA WIC local programs for the GHM staff training and matched them with six MA WIC control programs (I,C: (Springfield North, Springfield South), (North Suburban, Cape Cod), (Holyoke/Chicopee, North Shore), (Dorchester North, Cambridge/Somerville), (Chelsea/Revere, Lawrence), (Berkshire South, Outer Cape) based on size, cultural diversity, and urbanicity. Following ethnographic research by McCarthy and Associates, the GHM emotion-based ideas and strategies and survey questions were pre-tested in focus groups with WIC participants at non-study WIC sites (Kallio et al., 2007). Due to the mobility of WIC program participants (moving, dropping out of WIC and/or change in WIC status/eligibility), individual study participants were not followed longitudinally, as substantial loss-to-follow-up posed major concerns. Given these constraints on data collection, an anonymous survey for WIC program participants was a more logical and feasible choice for administration in the program setting.

Self-administered, quantitative pre- and post surveys for both staff and participants were administered over a period of four to six weeks in intervention and control sites at baseline (September-October 2008) and after approximately 15 months follow-up (January-February 2010). Following administration of the post-test survey in April 2010, trained personnel from the Harvard School of Public Health conducted four focus groups with participants and 12 in-depth interviews with staff at intervention sites, as described elsewhere [See Qualitative Reports].

### *Study Population*

All WIC participants who presented at selected intervention and control sites over a four to six week period at baseline and at follow-up were invited to participate in the study and then completed an anonymous, self-administered survey after providing informed consent. The WIC Director at each selected site returned anonymous participant surveys to the MDPH at the end of the survey period. All WIC staff members at selected sites were sent surveys and completed surveys after providing informed consent. Staff surveys were returned in confidential envelopes to the Harvard School of Public Health. The analytic samples for this report were 1743 WIC participants and 96 WIC staff at baseline (September-October 2008) and 2002 WIC participants and 84 WIC staff at follow-up in January-February 2010. The smaller number of participants at baseline compared with follow-up was related to the length of the survey administration periods. At baseline, the survey administration period was three to four weeks due to constraints imposed by the GHM training timeline.

### *Survey Development*

In order to assess the effect of the staff training on both participants and staff, the evaluation team at the Harvard School of Public Health worked in collaboration with the MDPH to develop the quantitative GHM staff and client surveys during the period of June-August 2008. We first reviewed the literature to identify established instruments and/or constructs of interest relevant for evaluation in the GHM surveys. The selection of constructs and adaptation and development of items for the surveys was an iterative process in which collaborating members presented drafts and discussed necessary revisions. The five final constructs of interests used in the GHM surveys include: client-provider communication, parental or staff self-efficacy, connectedness to WIC, likability

and emotion-based questions. Each existing instrument and research finding that guided the development of the GHM items and was used for adaptation is listed in the GHM construct grid (see Appendix 2).

The primary source for items adapted for the GHM survey was Shore & Franks' 1986 encounter-specific Physician Satisfaction Scale (PSS), an instrument that specifically assessed physician satisfaction based on their last patient-physician encounters. Our rationale for using the PSS is based on its previous adaptation and use in the WIC setting to assess client-provider communication (Newes-Adeyi et al., 2004) and its established reliability (Cronbach's alpha of 0.85 for the condensed, 16-item scale) and evidence of convergent validity (Shore & Franks, 1986). Nearly 75% of the GHM staff and client surveys were adapted from the PSS. Other existing items used for adaptation include the questions on school connectedness from the Add Health survey and the physician-patient likability scale (Hall et al., 2002).

The final staff and participant surveys consisted of 31 and 25 items, respectively (see Appendices 3 and 4). The general format of the GHM surveys (aside from the socio-demographic questions) follows a 5-point Likert-response scale in which respondents are given several statements and are instructed to rate how strongly they agreed or disagreed to each statement. Response categories included: strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree.

The GHM evaluation assesses both WIC staff and WIC participants' perceptions of client-provider communication, with similar or identical survey items. While this approach allows us to identify any discrepancies between perceived client-provider communications by type of respondent, we were cognizant of the literacy level appropriate for the WIC participant's version of the questionnaire. Pilot testing of both staff and participant surveys were conducted in order to address any issues that come up during survey administration,

and Spanish and Portuguese translations of the surveys were developed for WIC clients who feel more comfortable completing the survey in these languages.

### *Pilot Survey Results*

Prior to survey administration, both GHM staff and participant surveys were pre-tested on a sample of 9 WIC clients and 5 WIC staff from a non-study WIC site. Overall, both the staff and participant surveys were well-received. Both WIC staff and client respondents appreciated the brevity of the surveys as well as the clarity of the items and instructions. In terms of the content of the survey, WIC clients reported feeling “very comfortable” with answering the items and that the survey “allowed for honest answers.” One WIC client discussed that “this survey helps me to express myself, which makes me feel very important.” WIC staff also reported feeling comfortable in answering honestly, particularly with having the consent form ensuring confidentiality; however, staff respondents also discussed that the survey “seems to be targeted toward staff who have more of a relationship with clients that developed over time”. Staff participating in the pre-test also brought up the possibility of getting “false positive answers [on the survey]...since everyone I think seems to think they are doing a great job at all of these things.” Additionally, one WIC staff member pointed out that the answers provided to the questions can “vary depending on the client’s personality...and if [the staff] can relate to them culturally.” Based on respondents’ feedback and suggestions, we made minor edits in wording and eliminated one item from the client survey and two items from the staff survey.

## *Measures*

### Baseline socio-demographic characteristics

Information about gender, age, race/ethnicity, nativity and primary language were reported by participating WIC staff and participants administered in fall of 2008.

### Client-provider communication

Parallel items assessing client-provider communication were developed for WIC staff and participants and included questions concerning openness, clarity of communication, level of understanding between client and staff, overall rapport, relevance of nutritional counseling and respect between client and staff. Examples include: “I am able to be very open with WIC staff” vs. “WIC clients are able to be very open with me,” and “The WIC staff value my ideas on how to feed my child” vs. “My counseling is meaningful to WIC clients” (see Appendix 3-Parent Survey: Items #9-10, 12, 14-19 and Appendix 3, Items #12-15, 17-19, 22-24).

### Self-efficacy

Items assessing staff counseling self-efficacy were adapted from the PSS and included in the staff GHM survey. Examples of these items included: “I feel competent to handle WIC clients’ child feeding concerns,” and “I feel comfortable using a variety of tools to assess my clients’ needs” (see Appendix 4-Staff Survey: Items #6-11). WIC Staff were also asked to assess parental self-efficacy (see Appendix 4: Items #26-28). WIC participants were asked corresponding items assessing parental self-efficacy. These items were developed based on FIT WIC research (Whitaker et al., 2004) and included “I feel confident I can help my child develop healthy eating habits” (see Appendix 3, Items #6-7).

### Connectedness to WIC

The GHM surveys included items assessing staff and clients’ connectedness to the WIC program, which were adapted from the Add Health survey measuring school

connectedness among students and parents (CPC, 2008). Items measuring connectedness included: “I feel connected to the WIC program” and “I feel close to the staff/clients at my WIC program” (see Appendix 2, Questions # 23-25 and Appendix 3, Questions #29-31).

### Likability

Parallel items evaluating likability between WIC staff and clients were estimated with two questions (see Appendix 2, Questions #20-21 and Appendix 3, Questions #20-21). Items were adapted from the physician-patient likability scale developed by Hall and colleagues (2002).

### Emotion-based Items

Items assessing the emotional connection between WIC staff and clients were developed based on findings from an ethnographic report on the staff-client interactions in the WIC setting (McCarthy, 2008) (see Appendix 2, Questions # 11,13 and Appendix 3, Questions #16,25).

## *Statistical Analysis*

Separate descriptive analyses were conducted for the WIC staff and WIC participants. Responses were stratified and compared by intervention status within respondent group (staff, participant) at baseline and at follow-up (post-test). For each socio-demographic characteristic and each questionnaire item, chi-square tests (or an exact permutation tests when staff cell sizes were small) were employed to evaluate group differences.

In order to assess changes that may have resulted from participation in the GHM intervention, we: 1) computed summary statistics, 2) then compared intervention and control sites at follow-up and 3) analyzed change from pre-test to follow-up in intervention compared with control sites. We computed follow-up summary statistics and group comparison tests for two primary outcomes: overall satisfaction (Q25) and a survey summary score that added 'Yes' responses across all survey items. We also computed the five sub-scale scores from items measuring client provider communication, self efficacy, connectedness to WIC, likability, and emotion-based items for participants and for staff. Mean scores at follow-up were computed and compared for the intervention and control sites using a t-test (or Wilcoxon Rank Sum nonparametric test when distributional assumptions were not met). To assess change from pre-test to post-test, generalized estimating equation (GEE) models were used to assess group differences in overall satisfaction and the survey summary score while adjusting for within-site clustering and for possible confounding by socio-demographic characteristics.

## Results

### Baseline characteristics of participating WIC programs

Table 1 presents the baseline socio-demographic characteristics of WIC participants in control and intervention sites with chi-squared statistics indicating any significant differences in characteristics between treatment groups. Overall, participants' baseline characteristics did not vary by treatment status for age ( $p=0.066$ ) or sex ( $p=0.24$ ). The overwhelming majority (>92%) of WIC participants were female. A smaller percentage of participants in control sites (44.0%) were born in the U.S. compared to 53.4% of participants in intervention sites ( $p=0.0001$ ). English was the most common primary language spoken at home for participants in both control (43.0%) and intervention (48.0%) sites, followed by Spanish (28.9% and 29.1% respectively), Portuguese (10.5% and 4.0%, respectively) and Other (2.8% and 2.6%, respectively) ( $p<0.0001$ ). About half of participants self-reported their race/ethnicity as Hispanic/Latino (49.1% in the control sites vs. 52.7% in the intervention sites), followed by White (25.3% and 25.2%, respectively), Black/African American (10.3% and 10.5%, respectively), Other (2.6% and 4.0%, respectively) and Asian/Pacific Islander (0.5% and 0%, respectively) ( $p=0.047$ ).

Table 2 presents the baseline socio-demographic characteristics of WIC staff in control and intervention sites with chi-squared statistics indicating any significant differences in characteristics between treatment groups. Overall, there were no statistical differences in staff baseline socio-demographic characteristics (age, nativity, primary language, race/ethnicity and staff type) between the control and intervention sites. 68.8% of staff in the control sites were born in the U.S. compared to 58.3% of staff in the intervention sites. English was the primary language spoken at home for the majority of staff in both control (70.8%) and intervention (64.6%) sites, followed by Spanish (14.6%, 14.6%) and Other (12.5%, 10.4%). The majority of staff in control and intervention sites

self-reported their race/ethnicity as White (66.7% and 56.3%, respectively), followed by Hispanic/Latino (18.8%, 27.1%), Asian/Pacific Islander (5.3%, 12.5%) and Black (4.2%, 4.2%). Over half of the staff were program nutritionists or senior nutritionists, with nutrition assistants as the second most common position.

### Client-provider communication

At baseline, the majority of participants in control and intervention sites responded positively to items on client-provider communication, with  $\geq 90\%$  of responses falling either in the “strongly agree” or “agree” categories (see Table 3, Questions #9-10, 12, 14-19). Overall, there were no differences in responses between treatment groups with the exception of Question 16 concerning relevance of nutrition information WIC staff provides. A slightly greater percentage of participants in intervention sites (3.8%) responded “neither agree nor disagree” compared to 1.7% of participants in control sites.

Among staff, the majority of responses on client-provider communication were also overall positive but to a lesser degree compared to participant responses,  $\geq 68\%$  of respondents in both control and intervention sites responding “Strongly Agree” or “Agree” to items on client-provider communication (see Table 4, Questions #12-15, 17-19, 22-24). There were few differences in responses between treatment groups with the exception of Question 23 overall rapport with WIC clients. A greater percentage of staff in control sites responded “neither agree nor disagree” (16.7%) or “strongly disagree” (4.2%) to this item compared staff responses in the intervention sites (4.2% and 0%, respectively).

### Self-efficacy

Overall, participants at baseline felt confident in terms of helping their children develop healthy eating habits and feeding them well, with  $\geq 95\%$  of responses falling in the “strongly agree” or “agree” categories (see Table 3, Questions #6-7). There were no significant differences in responses based on treatment status.

Similarly, staff reported feeling confident in their counseling skills, with  $\geq 91\%$  of responses falling in the “strongly agree” or “agree” categories (see Table 4, Questions #6-11). There were no significant differences in responses based on treatment status.

### Connectedness to WIC

The majority of participants in both control and intervention sites reported feeling connected to the WIC program at baseline and feeling satisfied with their relationship with WIC staff, with  $\geq 81\%$  of responses falling in the “strongly agree” or “agree” categories. Fewer participants responded “strongly agree” or “agree” on item 23 concerning feeling connected to the WIC staff (76.2% in the control sites and 56.3% in intervention sites) (see Table 3, Questions # 23-25). No significant differences in responses based on treatment status were observed.

The majority of staff also responded positively on WIC connectedness, with  $\geq 81\%$  responding “strongly agree” or “agree” on feeling close to their WIC clients,  $\geq 89\%$  responding “strongly agree” or “agree” on feeling connected to the WIC program, and  $\geq 95\%$  responding “strongly agree” or “agree” on feeling satisfied with their relationship with WIC clients (see Table 4, Questions #29-31). No significant differences in responses based on treatment status were observed.

### Likability

Participants at baseline overall responded positively to likability items, with  $\geq 95\%$  responding “strongly agree” or “agree” on liking the WIC staff and  $\geq 81\%$  responding “strongly agree” or “agree” on perceiving that WIC staff like them (see Table 3, Questions #20-21).

Among staff, the majority of responses on likability were also positive, with  $\geq 95\%$  responding “strongly agree” or “agree” on liking their WIC clients and  $\geq 85\%$  responding

“strongly agree” or “agree” on perceiving that WIC clients like them (see Table 4, Questions #20-21).

### Emotion-based themes

The majority of participants responded positively to emotion-based items on the survey. Over 91% of participants at baseline responded “strongly agree” or “agree” on feeling emotionally comfortable talking with WIC staff and on feeling that staff took the time to see what happened since the last visit (see Table 3, Questions #11,13).

Similarly, ≥91% of staff at baseline responded “strongly agree” or “agree” on feeling emotionally comfortable talking with WIC clients and ≥81% responding “strongly agree” or “agree” on being able to talk with their clients on an emotional level (see Table 4, Questions #16,25).

**Table 1. Baseline Socio-Demographic Characteristics of WIC Participants (n=1743)**

|  | Control |      | Intervention |      | p       |
|--|---------|------|--------------|------|---------|
|  | n       | %    | n            | %    |         |
| <b>Age Group</b> (45 missing)                    |         |      |              |      |         |
| 18-25  | 301     | 32.5 | 311          | 38.0 | 0.066   |
| 26-35  | 457     | 49.4 | 369          | 45.1 |         |
| 36-45  | 140     | 15.1 | 120          | 14.7 |         |
| <b>Sex</b> (52 missing)                          |         |      |              |      |         |
| Male   | 40      | 4.3  | 27           | 3.3  | 0.24    |
| Female   | 852     | 92.1 | 772          | 94.4 |         |
| <b>Born in the U.S</b> (62 missing)              |         |      |              |      |         |
| Yes  | 407     | 44.0 | 439          | 53.4 | 0.0001  |
| No   | 479     | 30.2 | 356          | 43.2 |         |
| <b>Primary Language at Home</b><br>(276 missing) |         |      |              |      |         |
| English  | 398     | 43.0 | 393          | 48.0 | <0.0001 |
| Spanish  | 261     | 28.9 | 238          | 29.1 |         |
| Portuguese                                       | 97      | 10.5 | 33           | 4.0  |         |
| Other  | 26      | 2.8  | 21           | 2.6  |         |
| <b>Race/Ethnicity</b> (108 missing)              |         |      |              |      |         |
| Hispanic/Latino                                  | 454     | 49.1 | 431          | 52.7 | 0.047   |
| Black/African-American                           | 95      | 10.3 | 86           | 10.5 |         |
| White  | 234     | 25.3 | 206          | 25.2 |         |
| Asian/Pacific Islander                           | 5       | 0.5  | 0            | 0    |         |
| Other  | 24      | 2.6  | 33           | 4.0  |         |

*Chi-square statistics used*

**Table 2. Baseline Socio-Demographic Characteristics of WIC Staff (n=96)**

|   | <b>Control (N=48)</b> |          | <b>Intervention (N=48)</b> |          | <b>p</b> |
|---|-----------------------|----------|----------------------------|----------|----------|
|   | <b>n</b>              | <b>%</b> | <b>n</b>                   | <b>%</b> |          |
| <b>Age Group</b>                            |                       |          |                            |          |          |
| 18-25                                       | 7                     | 14.6     | 8                          | 16.7     | 0.54     |
| 26-35                                       | 17                    | 35.4     | 12                         | 25.0     |          |
| 36-45                                       | 24                    | 50.0     | 28                         | 58.3     |          |
| <b>Born in the U.S (1 missing)</b>          |                       |          |                            |          |          |
| Yes   | 33                    | 68.8     | 28                         | 58.3     | 0.35     |
| No  | 15                    | 31.3     | 19                         | 39.6     |          |
| <b>Primary Language at Home (6 missing)</b> |                       |          |                            |          |          |
| English                                     | 34                    | 70.8     | 31                         | 64.6     | 0.97     |
| Spanish                                     | 7                     | 14.6     | 7                          | 14.6     |          |
| Other                                       | 6                     | 12.5     | 5                          | 10.4     |          |
| <b>Race/Ethnicity (1 missing)</b>           |                       |          |                            |          |          |
| Hispanic/Latino                             | 9                     | 18.8     | 13                         | 27.1     | 0.67     |
| Black/African-American                      | 2                     | 4.2      | 2                          | 4.2      |          |
| White                                       | 32                    | 66.7     | 27                         | 56.3     |          |
| Asian/Pacific Islander                      | 4                     | 5.3      | 6                          | 12.5     |          |
| Other                                       |                       |          |                            |          |          |
| <b>Staff Type (3 missing)</b>               |                       |          |                            |          |          |
| Program Senior/Nutritionist                 | 25                    | 52.1     | 28                         | 58.3     | 0.33     |
| Nutrition Assistant                         | 13                    | 27.1     | 17                         | 35.4     |          |
| Other                                       | 7                     | 14.6     | 3                          | 6.3      |          |

**Table 3. Baseline Responses of WIC Participants (n=1743)**

|   | Control (N=925) |      | Intervention (N=818) |      | p    |
|---|-----------------|------|----------------------|------|------|
|   | n               | %    | n                    | %    |      |
| <b>Q6. I am confident I can help my child develop healthy eating habits. (35 missing)</b> |                 |      |                      |      |      |
| Strongly Agree  | 682             | 73.7 | 578                  | 70.7 | 0.09 |
| Agree   | 202             | 21.9 | 216                  | 26.4 |      |
| Neither Agree nor Disagree  | 15              | 1.6  | 7                    | 0.86 |      |
| Disagree  | 4               | 0.4  | 1                    | 0.01 |      |
| Strongly Disagree   | 2               | 0.2  | 1                    | 0.1  |      |
| <b>Q7. WIC staff help me feel more confident in feeding my child well. (34 missing)</b>   |                 |      |                      |      |      |
| Strongly Agree  | 621             | 67.1 | 549                  | 67.1 | 0.24 |
| Agree   | 258             | 27.9 | 237                  | 29.0 |      |
| Neither Agree nor Disagree  | 20              | 2.2  | 18                   | 2.2  |      |
| Disagree  | 3               | 0.3  | 0                    | 0.0  |      |
| Strongly Disagree   | 3               | 0.3  | 0                    | 0.0  |      |
| <b>Q8. WIC staff believe I am doing the best as I can as a parent. (51 missing)</b>       |                 |      |                      |      |      |
| Strongly Agree  | 536             | 57.9 | 482                  | 58.9 | 0.15 |
| Agree   | 305             | 33.0 | 283                  | 34.6 |      |
| Neither Agree nor Disagree  | 46              | 5.0  | 29                   | 3.5  |      |
| Disagree  | 1               | 0.1  | 3                    | 0.4  |      |
| Strongly Disagree   | 6               | 0.6  | 1                    | 0.1  |      |
| <b>Q9. WIC staff really understand why I come to WIC. (41 missing)</b>                    |                 |      |                      |      |      |
| Strongly Agree  | 558             | 60.3 | 508                  | 62.1 | 0.73 |
| Agree   | 311             | 33.6 | 269                  | 32.9 |      |
| Neither Agree nor Disagree  | 28              | 3.0  | 23                   | 2.8  |      |
| Disagree  | 3               | 0.3  | 1                    | 0.1  |      |
| Strongly Disagree   | 1               | 0.1  | 0                    | 0.0  |      |
| <b>Q10. I am able to be very open with WIC staff. (36 missing)</b>                        |                 |      |                      |      |      |
| Strongly Agree  | 546             | 59.0 | 499                  | 61.0 | 0.79 |
| Agree   | 323             | 34.9 | 285                  | 34.8 |      |
| Neither Agree nor Disagree  | 28              | 3.0  | 18                   | 2.2  |      |
| Disagree  | 3               | 0.3  | 2                    | 0.2  |      |
| Strongly Disagree   | 2               | 0.2  | 1                    | 0.1  |      |

|  | Control (N=925) |      | Intervention (N=818) |      | p     |
|--|-----------------|------|----------------------|------|-------|
|  | n               | %    | n                    | %    |       |
| <b>Q11. Emotionally, I feel very comfortable talking with the WIC staff. (35 missing)</b>          |                 |      |                      |      |       |
| Strongly Agree   | 555             | 60.0 | 495                  | 60.5 | 0.72  |
| Agree  | 303             | 32.8 | 277                  | 33.9 |       |
| Neither Agree nor Disagree   | 35              | 3.8  | 27                   | 3.3  |       |
| Disagree   | 5               | 0.5  | 2                    | 0.2  |       |
| Strongly Disagree  | 6               | 0.6  | 3                    | 0.4  |       |
| <b>Q12. During WIC sessions, I feel like we have a good talk. (35 missing)</b>                     |                 |      |                      |      |       |
| Strongly Agree   | 552             | 59.7 | 476                  | 58.2 | 0.64  |
| Agree  | 326             | 35.2 | 304                  | 37.2 |       |
| Neither Agree nor Disagree   | 23              | 2.5  | 23                   | 2.8  |       |
| Disagree   | 2               | 0.2  | 0                    | 0.0  |       |
| Strongly Disagree  | 1               | 0.1  | 1                    | 0.1  |       |
| <b>Q13. I feel like staff take the time to see what happened since my last visit. (41 missing)</b> |                 |      |                      |      |       |
| Strongly Agree   | 511             | 55.2 | 437                  | 53.4 | 0.75  |
| Agree  | 332             | 35.9 | 303                  | 37.0 |       |
| Neither Agree nor Disagree   | 52              | 5.7  | 52                   | 6.4  |       |
| Disagree   | 5               | 0.5  | 7                    | 0.9  |       |
| Strongly Disagree  | 1               | 0.1  | 2                    | 0.2  |       |
| <b>Q14. WIC staff value my ideas on how to feed my child. (48 missing)</b>                         |                 |      |                      |      |       |
| Strongly Agree   | 491             | 53.1 | 441                  | 53.9 | 0.70  |
| Agree  | 357             | 38.6 | 310                  | 37.9 |       |
| Neither Agree nor Disagree   | 44              | 4.8  | 44                   | 5.4  |       |
| Disagree   | 3               | 0.3  | 3                    | 0.4  |       |
| Strongly Disagree  | 2               | 0.2  | 0                    | 0.0  |       |
| <b>Q15. WIC staff help me with my concerns about feeding my child. (51 missing)</b>                |                 |      |                      |      |       |
| Strongly Agree   | 551             | 59.6 | 482                  | 58.9 | 0.96  |
| Agree  | 315             | 34.1 | 291                  | 35.6 |       |
| Neither Agree nor Disagree   | 26              | 2.8  | 20                   | 2.4  |       |
| Disagree   | 3               | 0.3  | 2                    | 0.2  |       |
| Strongly Disagree  | 1               | 0.1  | 1                    | 0.1  |       |
| <b>Q16. The nutrition information WIC staff provides is relevant to me. (51 missing)</b>           |                 |      |                      |      |       |
| Strong Agree   | 521             | 56.3 | 432                  | 51.7 | 0.022 |
| Agree  | 357             | 38.6 | 326                  | 39.9 |       |
| Neither Agree nor Disagree   | 16              | 1.7  | 31                   | 3.8  |       |
| Disagree   | 2               | 0.2  | 6                    | 0.7  |       |
| Strongly Disagree  | 1               | 0.1  | 0                    | 0.0  |       |

|   | Control (N=925) |      | Intervention (N=818) |      | p    |
|---|-----------------|------|----------------------|------|------|
|   | n               | %    | n                    | %    |      |
| <b>Q17. The sessions with the WIC staff are worth my time. (53 missing)</b>             |                 |      |                      |      |      |
| Strongly Agree  | 572             | 61.8 | 497                  | 60.8 | 0.67 |
| Agree   | 291             | 31.5 | 270                  | 33.0 |      |
| Neither Agree nor Disagree  | 20              | 2.2  | 23                   | 2.8  |      |
| Disagree  | 8               | 0.9  | 4                    | 0.5  |      |
| Strongly Disagree   | 0               | 0.0  | 0                    | 0.0  |      |
| <b>Q18. I appreciate the WIC staff's efforts. (49 missing)</b>                          |                 |      |                      |      |      |
| Strongly Agree  | 661             | 71.5 | 557                  | 68.1 | 0.32 |
| Agree   | 223             | 24.1 | 232                  | 28.4 |      |
| Neither Agree nor Disagree  | 10              | 1.1  | 6                    | 0.7  |      |
| Disagree  | 1               | 0.1  | 1                    | 0.1  |      |
| Strongly Disagree   | 1               | 0.1  | 2                    | 0.2  |      |
| <b>Q19. I respect the WIC staff. (44 missing)</b>                                       |                 |      |                      |      |      |
| Strongly Agree  | 703             | 76.0 | 607                  | 74.2 | 0.57 |
| Agree   | 187             | 20.2 | 186                  | 22.7 |      |
| Neither Agree nor Disagree  | 7               | 0.8  | 5                    | 0.6  |      |
| Disagree  | 1               | 0.1  | 0                    | 0.0  |      |
| Strongly Disagree   | 1               | 0.1  | 2                    | 0.2  |      |
| <b>Q20. All in all, I like the WIC staff a lot. (48 missing)</b>                        |                 |      |                      |      |      |
| Strongly Agree  | 617             | 66.7 | 554                  | 67.7 | 0.71 |
| Agree   | 268             | 29.0 | 230                  | 28.1 |      |
| Neither Agree nor Disagree  | 10              | 1.1  | 13                   | 1.6  |      |
| Disagree  | 1               | 0.1  | 1                    | 0.1  |      |
| Strongly Disagree   | 0               | 0.0  | 1                    | 0.1  |      |
| <b>Q21. I think the WIC staff like me a lot. (66 missing)</b>                           |                 |      |                      |      |      |
| Strongly Agree  | 368             | 39.8 | 337                  | 41.2 | 0.43 |
| Agree   | 384             | 41.5 | 340                  | 41.6 |      |
| Neither Agree nor Disagree  | 127             | 13.7 | 114                  | 13.9 |      |
| Disagree  | 4               | 0.4  | 1                    | 0.1  |      |
| Strongly Disagree   | 0               | 0.0  | 2                    | 0.2  |      |
| <b>Q22. WIC staff asks me questions to help me talk about my concerns. (49 missing)</b> |                 |      |                      |      |      |
| Strongly Agree  | 467             | 50.5 | 427                  | 52.2 | 0.13 |
| Agree   | 373             | 40.3 | 337                  | 41.2 |      |
| Neither Agree nor Disagree  | 42              | 4.5  | 34                   | 4.2  |      |
| Disagree  | 10              | 1.1  | 1                    | 0.1  |      |
| Strongly Disagree   | 1               | 0.1  | 2                    | 0.2  |      |

|   | Control (N=925) |      | Intervention (N=818) |      | p    |
|---|-----------------|------|----------------------|------|------|
|   | n               | %    | n                    | %    |      |
| <b>Q23. I feel close to the staff at my WIC program.</b>                |                 |      |                      |      |      |
| (58 missing)  |                 |      |                      |      |      |
| Strongly Agree  | 361             | 39.0 | 302                  | 36.9 | 0.54 |
| Agree   | 344             | 37.2 | 327                  | 41.0 |      |
| Neither Agree nor Disagree  | 165             | 17.8 | 153                  | 18.7 |      |
| Disagree  | 17              | 1.8  | 12                   | 1.5  |      |
| Strongly Disagree   | 1               | 0.1  | 3                    | 0.4  |      |
| <b>Q24. I feel connected to the WIC program.</b>                        |                 |      |                      |      |      |
| (48 missing)  |                 |      |                      |      |      |
| Strongly Agree  | 419             | 45.3 | 384                  | 40.0 | 0.93 |
| Agree   | 375             | 40.5 | 341                  | 41.7 |      |
| Neither Agree nor Disagree  | 92              | 9.9  | 74                   | 9.0  |      |
| Disagree  | 4               | 0.4  | 3                    | 0.4  |      |
| Strongly Disagree   | 2               | 0.2  | 1                    | 0.1  |      |
| <b>Q25. Overall, I am satisfied with my relationship with WIC staff</b> |                 |      |                      |      |      |
| (42 missing)  |                 |      |                      |      |      |
| Strongly Agree  | 572             | 61.8 | 496                  | 60.6 | 0.82 |
| Agree   | 300             | 32.4 | 277                  | 33.9 |      |
| Neither Agree nor Disagree  | 23              | 2.5  | 26                   | 3.2  |      |
| Disagree  | 2               | 0.2  | 2                    | 0.2  |      |
| Strongly Disagree   | 1               | 0.1  | 2                    | 0.2  |      |

**Table 4. Baseline Responses of WIC Staff (n=96)**

|  | Control (N=48) |      | Intervention (N=48) |      | p    |
|--|----------------|------|---------------------|------|------|
|  | n              | %    | n                   | %    |      |
| <b>Q6. I think I really understand why WIC clients see me.</b>   |                |      |                     |      |      |
| Strongly Agree   | 23             | 47.9 | 25                  | 50.0 | 0.58 |
| Agree  | 24             | 50.0 | 23                  | 47.9 |      |
| Neither Agree nor Disagree   | 1              | 2.1  | 0                   | 0.0  |      |
| Disagree   | 0              | 0.0  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q7. After meeting with WIC clients, I have a good understanding of how they feed their child. (2 missing)</b> |                |      |                     |      |      |
| Strongly Agree   | 10             | 20.8 | 14                  | 29.2 | 0.57 |
| Agree  | 34             | 70.8 | 32                  | 66.7 |      |
| Neither Agree nor Disagree   | 1              | 2.1  | 2                   | 4.2  |      |
| Disagree   | 1              | 2.1  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q8. I feel competent to handle WIC clients' child feeding concerns.</b>                                       |                |      |                     |      |      |
| Strongly Agree   | 27             | 56.3 | 29                  | 60.4 | 0.36 |
| Agree  | 19             | 39.6 | 19                  | 39.6 |      |
| Neither Agree nor Disagree   | 2              | 4.2  | 0                   | 0.0  |      |
| Disagree   | 0              | 0.0  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q9. I feel comfortable using a variety of tools to assess my clients' needs.</b>                              |                |      |                     |      |      |
| Strongly Agree   | 26             | 54.2 | 28                  | 58.3 | 0.55 |
| Agree  | 19             | 39.6 | 18                  | 37.5 |      |
| Neither Agree nor Disagree   | 3              | 6.3  | 1                   | 2.1  |      |
| Disagree   | 0              | 0.0  | 1                   | 2.1  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q10. I guide WIC clients to solutions regarding their child feeding concerns.</b>                             |                |      |                     |      |      |
| Strongly Agree   | 23             | 47.9 | 24                  | 50.0 | 0.21 |
| Agree  | 22             | 45.8 | 24                  | 50.0 |      |
| Neither Agree nor Disagree   | 3              | 6.3  | 0                   | 0.0  |      |
| Disagree   | 0              | 0.0  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q11. I use my time with WIC clients effectively.</b>  |                |      |                     |      |      |
| Strong Agree   | 22             | 45.8 | 25                  | 52.1 | 0.39 |
| Agree  | 22             | 45.8 | 21                  | 43.7 |      |
| Neither Agree nor Disagree   | 4              | 8.3  | 1                   | 2.1  |      |
| Disagree   | 0              | 0.0  | 1                   | 2.1  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |

|   | Control (N=48) |       | Intervention (N=48) |      | p     |
|---|----------------|-------|---------------------|------|-------|
|   | n              | %     | n                   | %    |       |
| <b>Q12. My counseling is meaningful to WIC</b>  |                |       |                     |      |       |
| Strongly Agree  | 11             | 22.9  | 19                  | 39.6 | 0.27  |
| Agree   | 32             | 66.7  | 26                  | 54.2 |       |
| Neither Agree nor Disagree  | 4              | 8.3   | 3                   | 6.3  |       |
| Disagree  | 0              | 0.0   | 0                   | 0.0  |       |
| Strongly Disagree   | 1              | 2.1   | 0                   | 0.0  |       |
| <b>Q13. WIC clients explain their child feeding concerns in terms I can understand. (1 missing)</b> |                |       |                     |      |       |
| Strongly Agree  | 17             | 35.4  | 16                  | 33.3 | 0.098 |
| Agree   | 26             | 54.2  | 32                  | 66.7 |       |
| Neither Agree nor Disagree  | 4              | 8.33  | 0                   | 0.0  |       |
| Disagree  | 0              | 0.0   | 1                   | 2.1  |       |
| Strongly Disagree   | 0              | 0.0   | 0                   | 0.0  |       |
| <b>Q14. WIC clients understand what I say. (1 missing)</b>  |                |       |                     |      |       |
| Strongly Agree  | 13             | 27.1  | 17                  | 35.4 | 0.55  |
| Agree   | 30             | 62.5  | 27                  | 56.3 |       |
| Neither Agree nor Disagree  | 5              | 10.4  | 3                   | 6.3  |       |
| Disagree  | 0              | 0.0   | 0                   | 0.0  |       |
| Strongly Disagree   | 0              | 0.0   | 0                   | 0.0  |       |
| <b>Q15. Clients are able to be very open with me. (1 missing)</b>                                   |                |       |                     |      |       |
| Strongly Agree  | 15             | 31.25 | 17                  | 35.4 | 0.75  |
| Agree   | 24             | 50.0  | 23                  | 47.9 |       |
| Neither Agree nor Disagree  | 7              | 14.6  | 8                   | 8.42 |       |
| Disagree  | 0              | 0.0   | 0                   | 0.0  |       |
| Strongly Disagree   | 1              | 2.1   | 0                   | 0.0  |       |
| <b>Q16. Emotionally, I feel very comfortable talking with WIC clients.</b>                          |                |       |                     |      |       |
| Strongly Agree  | 26             | 54.2  | 24                  | 50.0 | 0.88  |
| Agree   | 19             | 39.6  | 20                  | 41.7 |       |
| Neither Agree nor Disagree  | 3              | 6.3   | 4                   | 8.3  |       |
| Disagree  | 0              | 0.0   | 0                   | 0.0  |       |
| Strongly Disagree   | 0              | 0.0   | 0                   | 0.0  |       |
| <b>Q17. WIC clients seem satisfied with my nutritional counseling.</b>                              |                |       |                     |      |       |
| Strongly Agree  | 18             | 37.5  | 17                  | 35.4 | 0.55  |
| Agree   | 27             | 56.3  | 30                  | 62.3 |       |
| Neither Agree nor Disagree  | 3              | 6.3   | 1                   | 2.1  |       |
| Disagree  | 0              | 0.0   | 0                   | 0.0  |       |
| Strongly Disagree   | 0              | 0.0   | 0                   | 0.0  |       |

|   | Control (N=48) |      | Intervention (N=48) |      | p     |
|---|----------------|------|---------------------|------|-------|
|   | n              | %    | n                   | %    |       |
| <b>Q18. I believe that WIC clients appreciate my efforts.</b>   |                |      |                     |      |       |
| Strongly Agree  | 12             | 25.0 | 16                  | 33.3 | 0.097 |
| Agree   | 25             | 50.0 | 28                  | 58.3 |       |
| Neither Agree nor Disagree  | 11             | 22.9 | 3                   | 6.3  |       |
| Disagree  | 0              | 0.0  | 0                   | 0.0  |       |
| Strongly Disagree   | 0              | 0    | 1                   | 2.1  |       |
| <b>Q19. I believe WIC clients respect me.</b>   |                |      |                     |      |       |
| Strongly Agree  | 15             | 31.3 | 13                  | 27.1 | 0.23  |
| Agree   | 24             | 50.0 | 31                  | 64.6 |       |
| Neither Agree nor Disagree  | 9              | 18.7 | 4                   | 8.33 |       |
| Disagree  | 0              | 0.0  | 0                   | 0.0  |       |
| Strongly Disagree   | 0              | 0.0  | 0                   | 0.0  |       |
| <b>Q20. All in all, I like my clients.</b>  |                |      |                     |      |       |
| Strongly Agree  | 22             | 45.8 | 22                  | 45.8 | 1.00  |
| Agree   | 24             | 50.0 | 24                  | 50.0 |       |
| Neither Agree nor Disagree  | 2              | 4.2  | 2                   | 4.2  |       |
| Disagree  | 0              | 0.0  | 0                   | 0.0  |       |
| Strongly Disagree   | 0              | 0.0  | 0                   | 0.0  |       |
| <b>Q21. I think WIC clients like me a lot.</b><br>(1 missing)   |                |      |                     |      |       |
| Strongly Agree  | 14             | 29.2 | 15                  | 31.3 | 0.94  |
| Agree   | 27             | 56.3 | 28                  | 58.3 |       |
| Neither Agree nor Disagree  | 6              | 12.5 | 5                   | 10.4 |       |
| Disagree  | 0              | 0.0  | 0                   | 0.0  |       |
| Strongly Disagree   | 0              | 0.0  | 0                   | 0.0  |       |
| <b>Q22. WIC clients give me a clear idea of how their concerns about feeding their child affect their life.</b> |                |      |                     |      |       |
| Strongly Agree  | 4              | 8.3  | 9                   | 18.7 | 0.16  |
| Agree   | 29             | 60.4 | 31                  | 64.6 |       |
| Neither Agree nor Disagree  | 13             | 27.1 | 8                   | 16.7 |       |
| Disagree  | 0              | 0.0  | 0                   | 0.0  |       |
| Strongly Disagree   | 2              | 4.2  | 0                   | 0.0  |       |
| <b>Q23. My overall rapport with WIC clients is very high.</b> (1 missing)                                       |                |      |                     |      |       |
| Strongly Agree  | 19             | 39.6 | 14                  | 29.2 | 0.043 |
| Agree   | 21             | 43.7 | 31                  | 64.6 |       |
| Neither Agree nor Disagree  | 8              | 16.7 | 2                   | 4.2  |       |
| Disagree  | 0              | 0.0  | 0                   | 0.0  |       |
| Strongly Disagree   | 2              | 4.2  | 0                   | 0.0  |       |

|  | Control (N=48) |      | Intervention (N=48) |      | p    |
|--|----------------|------|---------------------|------|------|
|  | n              | %    | n                   | %    |      |
| <b>Q24. The time I spend with WIC clients feels like a conversation.</b> |                |      |                     |      |      |
| Strongly Agree   | 18             | 37.5 | 21                  | 43.7 | 0.67 |
| Agree  | 26             | 54.2 | 22                  | 45.8 |      |
| Neither Agree nor Disagree   | 4              | 8.3  | 4                   | 8.3  |      |
| Disagree   | 0              | 0.0  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 1                   | 2.1  |      |
| <b>Q25. I talk with my clients on an emotional level.</b>                |                |      |                     |      |      |
| Strongly Agree   | 16             | 33.3 | 11                  | 22.9 | 0.35 |
| Agree  | 28             | 58.3 | 28                  | 58.3 |      |
| Neither Agree nor Disagree   | 8.3            | 4.17 | 8                   | 16.7 |      |
| Disagree   | 0              | 0.0  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 1                   | 2.1  |      |
| <b>Q26. I believe my clients are capable of making changes.</b>          |                |      |                     |      |      |
| Strongly Agree   | 13             | 27.1 | 17                  | 35.4 | 0.35 |
| Agree  | 34             | 70.8 | 28                  | 58.3 |      |
| Neither Agree nor Disagree   | 1              | 2.1  | 3                   | 6.3  |      |
| Disagree   | 0              | 0.0  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q27. I believe WIC clients make changes based on our interaction.</b> |                |      |                     |      |      |
| Strongly Agree   | 6              | 12.5 | 8                   | 16.7 | 0.56 |
| Agree  | 30             | 62.5 | 32                  | 66.7 |      |
| Neither Agree nor Disagree   | 12             | 25.0 | 8                   | 16.7 |      |
| Disagree   | 0              | 0.0  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q28. I think my clients are doing the best they can as parents.</b>   |                |      |                     |      |      |
| Strongly Agree   | 9              | 18.7 | 14                  | 29.2 | 0.27 |
| Agree  | 30             | 62.5 | 29                  | 60.4 |      |
| Neither Agree nor Disagree   | 9              | 18.7 | 4                   | 8.3  |      |
| Disagree   | 0              | 0.0  | 1                   | 2.1  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |

|  | Control (N=48) |      | Intervention (N=48) |      | p    |
|--|----------------|------|---------------------|------|------|
|  | n              | %    | n                   | %    |      |
| <b>Q29. I feel close to the clients at my WIC program. (1 missing)</b>     |                |      |                     |      |      |
| Strong Agree   | 12             | 25.0 | 14                  | 29.2 | 0.77 |
| Agree  | 27             | 56.3 | 27                  | 56.3 |      |
| Neither Agree nor Disagree   | 7              | 14.6 | 7                   | 14.6 |      |
| Disagree   | 1              | 2.1  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q30. I feel connected to the WIC program.</b>                           |                |      |                     |      |      |
| Strong Agree   | 22             | 45.8 | 22                  | 45.8 | 0.68 |
| Agree  | 22             | 45.8 | 21                  | 43.8 |      |
| Neither Agree nor Disagree   | 3              | 6.3  | 5                   | 10.4 |      |
| Disagree   | 1              | 2.1  | 0                   | 0    |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Q31. Overall, I am satisfied with my relationship with WIC clients.</b> |                |      |                     |      |      |
| Strong Agree   | 24             | 50.0 | 24                  | 50.0 | 0.84 |
| Agree  | 22             | 45.8 | 23                  | 47.9 |      |
| Neither Agree nor Disagree   | 2              | 4.2  | 1                   | 2.1  |      |
| Disagree   | 1              | 2.1  | 0                   | 0.0  |      |
| Strongly Disagree  | 0              | 0.0  | 0                   | 0.0  |      |

## Follow-up characteristics of participating WIC programs

Table 5 presents the follow-up socio-demographic characteristics of WIC participants in control and intervention sites with chi-squared statistics indicating any significant differences in characteristics between treatment groups. Overall, participants' follow-up characteristics did vary by treatment status for age ( $p=0.03$ ), gender ( $p=0.007$ ), nativity ( $p<.0001$ ), primary language spoken at home ( $p<.0001$ ), or race/ethnicity ( $p=.007$ ). The overwhelming majority (96%) of WIC participants were female. A smaller percentage of participants in control sites (43.1%) were born in the U.S. compared to 62.4% of participants in intervention sites. English was the primary language spoken at home for the 45% of participants in the control and 66.4% in intervention sites, followed by Spanish (39.9% and 28.3% respectively), Portuguese (10.0% and 2.7%, respectively) and Other (5.1% and 2.6%, respectively). The majority of participants self-reported their race/ethnicity as Hispanic/Latino (58.6% in the control sites vs. 54.1% in the intervention sites), followed by White (23.6% and 32.5%, respectively), Black/African American (9.9% and 10.3%, respectively), Asian/Pacific Islander (3.4% and 1.4%, respectively), and Other (4.5% and 1.7%, respectively).

Table 6 presents the baseline socio-demographic characteristics of WIC staff in control and intervention sites with chi-squared statistics (or exact permutation tests when cell sizes are small) indicating any significant differences in characteristics between groups. Overall, there were no statistical differences in staff follow-up socio-demographic characteristics (age, nativity, primary language, race/ethnicity and staff type) between the control and intervention sites. 64.1% of staff in the control sites were born in the U.S. compared to 63.4% of staff in the intervention sites. English was the primary language spoken at home for the majority of staff in both control (79.4%) and intervention (76.3%) sites, followed by Spanish (14.7%, 10.5%) and Other (5.9%, 13.2%). The majority of staff

in control and intervention sites self-reported their race/ethnicity as White (55.0% and 63.4%, respectively), followed by Hispanic/Latino (30.0%, 24.4%), Asian/Pacific Islander (12.5%, 9.8%) and Black (2.5%, 2.4%). Over half of the staff in both the control and intervention sites were Program nutritionists or senior nutritionists (52.5% and 55.8% respectively), followed by nutrition assistants (40.0% and 34.9% respectively), and other staff members (7.5% and 9.3% respectively).

### Group Differences in Statement Responses

Table 7 presents items with significant differences in follow-up response between the control and intervention site parent participants. Though the majority of subjects responded positively to all statements in both the control and intervention sites, there were statistically significant or borderline significant category differences for three statements at follow-up (Q6, Q12, and Q16). However, when categories were combined into measures of 'agreement' (i.e. strongly agree and agree vs. neither, disagree, and strongly disagree) group differences are no longer significant.

For the statement "I am confident I can help my child develop healthy eating habits" (Q6), 75.5% of the control sites and 71.4% at the intervention sites responded 'strongly agree' while the response was 'agree' for 23.4% and 27.2% of these groups, respectively ( $p=.02$ ). Despite these significant category differences between groups, overall agreement was excellent, with 99% of the control sites participants and 98% of the intervention sites participants' responses falling into either the 'strongly agree' or 'agree' categories.

Similarly, for the statement "During WIC sessions, I feel like we have a good talk" (Q12), group differences on specific responses approached significance ( $p=.07$ ). Though overall agreement was 96% for both groups, 59.1% of the control sites participants and 58.4% of the intervention group chose the 'strongly agree' response; for the 'agree'

category the percentages for control and intervention sites participants were 36.7% and 37.9% respectively.

Category differences also approached significance ( $p=.08$ ) for the statement “The nutrition information WIC staff provides is relevant to me” (Q16), with 56.3% of the control sites participants and 52.6% of the intervention sites participants responding ‘strongly agree’ and 40.4% and 43.0% respectively, responding ‘agree’. Overall agreement was 96% for both groups, choosing either the ‘strongly agree’ or ‘agree’ options.

Note that for all statements on the survey, overall participant responses were extremely positive at all sites, and there were only minor percentage differences between participants in the control and intervention sites on the dichotomized measure of ‘agreement’ (i.e. strongly agree and agree vs. neither, disagree, and strongly disagree).

Table 8 presents the significant and borderline significant category differences at follow-up for staff responses. For the statement “I feel comfortable using a variety of tools to assess my clients’ needs” (q4), 63.4% of the staff at control sites and 30.2% of intervention sites staff responded ‘strongly agree’; 36.6% and 58.4%, respectively, chose ‘agree’ as their response ( $p = .003$ ). When measured as overall ‘agreement’ for this statement, 100% of the control sites agreed and 88.6% of the intervention sites agreed.

For the statement, “I think my clients are doing the best they can as parents” (Q28), group differences were borderline significant ( $p = .10$ ), with 9.8% of the control group choosing ‘strongly agree’ and 27.9% of the intervention group selecting this response; for the ‘agree’ category, percentage responses were 68.3% and 62.8% for the staff at the control and intervention sites respectively.

## Follow-up Summary and Sub-scale Measures

At follow-up, more than 95% of participants in control and intervention sites responded positively to the overall satisfaction statement “Overall, I am satisfied with my relationship with the WIC staff” (Q25). Sub-scale and summary scores also yielded high positive responses in all areas, including total satisfaction summary (Q6-Q24), client-provider communication (Q9,Q10,Q12,Q14-Q19), self-efficacy (Q6,Q7), connectedness to WIC (Q23-Q25), likability (Q20,Q21), and emotion-based items (Q11,Q13).

Table 9 presents the total and adjusted mean summary and subscale scores for participants at the control and intervention sites, as well as the t-tests to assess group differences. The range of the mean adjusted scores for all measures (1.3-1.7) indicates that the majority of the participants responded positively on these summary and subscale measures, choosing on average the ‘strongly agree’ (adjusted score of 1) or ‘agree’ (adjusted score of 2) categories. There were no significant differences in summary or subscale scores between the participant groups at the control and intervention sites.

Table 10 presents the total and adjusted mean summary and subscale scores for staff at the control and intervention sites, as well as the t-tests (or Wilcoxon Rank Sum tests when normality assumptions are not met) to assess group differences. The range of the mean adjusted scores for all measures (1.6-1.8) indicates that the majority of the staff responded positively on these summary and subscale measures, choosing on average the ‘strongly agree’ (adjusted score of 1) or ‘agree’ (adjusted score of 2) categories. There were no significant differences in summary or subscale scores between the staff at the control and intervention sites.

## Change assessment

No significant group differences were found between the parent participants in the intervention and control sites for either overall satisfaction (Q25) ( $p=.32$ ) or item summary score (Q6-Q24) ( $p=.78$ ). Nativity was borderline significant ( $p=.1$ ) in its impact on follow-up item summary score for both groups, with those not born in the US showing greater agreement across questions ( $\beta=-1.09$ ) than those US born. No significant group differences were found between staff in the intervention and control sites for either overall satisfaction (Q31) ( $p=.83$ ) or item summary score (Q6-Q30) ( $p=.41$ ). Nativity was borderline significant ( $p=.06$ ) in its impact on follow-up item summary score for both groups, with those not born in the US showing greater agreement across questions ( $\beta=-6.88$ ) than those US born.

**Table 5. Follow-up Socio-Demographic Characteristics of WIC Participants (n=2002)**

|                         | Control (n=1311) |      | Intervention (n=691) |      | p         |
|-------------------------|------------------|------|----------------------|------|-----------|
|                         | n                | %    | n                    | %    |           |
| <b>Age Group</b>        |                  |      |                      |      |           |
| 18-25                   | 411              | 34.2 | 266                  | 40.4 | 0.03*     |
| 26-35                   | 584              | 48.6 | 290                  | 44.1 |           |
| 36-45                   | 207              | 17.2 | 102                  | 15.5 |           |
| <b>Gender</b>           |                  |      |                      |      |           |
| Male                    | 58               | 5.0  | 16                   | 2.4  | 0.007*    |
| Female                  | 1091             | 95.0 | 644                  | 97.6 |           |
| <b>Nativity</b>         |                  |      |                      |      |           |
| Yes                     | 495              | 43.1 | 411                  | 62.4 | < 0.0001* |
| No                      | 654              | 56.9 | 248                  | 37.6 |           |
| <b>Primary Language</b> |                  |      |                      |      |           |
| English                 | 476              | 45.0 | 387                  | 66.4 | < 0.0001* |
| Spanish                 | 422              | 39.9 | 165                  | 28.3 |           |
| Portuguese              | 106              | 10.0 | 16                   | 2.7  |           |
| Other                   | 54               | 5.1  | 15                   | 2.6  |           |
| <b>Race/Ethnicity</b>   |                  |      |                      |      |           |
| Hispanic/Latino         | 679              | 58.6 | 352                  | 54.1 | 0.007*    |
| Black/African-American  | 115              | 9.9  | 67                   | 10.3 |           |
| White                   | 273              | 23.6 | 211                  | 32.5 |           |
| Asian/Pacific Islander  | 40               | 3.4  | 9                    | 1.4  |           |
| Other                   | 52               | 4.5  | 11                   | 1.7  |           |

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\*Significant at  $p < .05$ , chi-square test

**Table 6. Follow-up Socio-Demographic Characteristics of WIC Staff (n=84)**

|                             | Control (N=41) |      | Intervention (N=43) |      | p    |
|-----------------------------|----------------|------|---------------------|------|------|
|                             | n              | %    | n                   | %    |      |
| <b>Age Group</b>            |                |      |                     |      |      |
| 18-25                       | 6              | 14.6 | 4                   | 9.3  | 0.64 |
| 26-35                       | 12             | 29.3 | 11                  | 25.6 |      |
| 36-45                       | 23             | 56.1 | 28                  | 65.1 |      |
| <b>Nativity</b>             |                |      |                     |      |      |
| Yes                         | 25             | 64.1 | 26                  | 63.4 | 0.95 |
| No                          | 14             | 35.9 | 15                  | 36.6 |      |
| <b>Primary Language</b>     |                |      |                     |      |      |
| English                     | 27             | 79.4 | 29                  | 76.3 | 0.53 |
| Spanish                     | 5              | 14.7 | 4                   | 10.5 |      |
| Other                       | 2              | 5.9  | 5                   | 13.2 |      |
| <b>Race/Ethnicity</b>       |                |      |                     |      |      |
| Hispanic/Latino             | 12             | 30.0 | 10                  | 24.4 | 0.89 |
| Black/African-American      | 1              | 2.5  | 1                   | 2.4  |      |
| White                       | 22             | 55.0 | 26                  | 63.4 |      |
| Asian/Pacific Islander      | 5              | 12.5 | 4                   | 9.8  |      |
| Other                       | 0              | 0.0  | 0                   | 0.0  |      |
| <b>Staff Type</b>           |                |      |                     |      |      |
| Program Senior/Nutritionist | 21             | 52.5 | 24                  | 55.8 | 0.88 |
| Nutrition Assistant         | 16             | 40.0 | 15                  | 34.9 |      |
| Other                       | 3              | 7.5  | 4                   | 9.3  |      |

*Chi-square/exact permutation test used to evaluate group differences*

**Table 7. Significant Group Differences in Follow-up Responses of WIC Participants (n=2002)**

|  | Control (N=1311) |      | Intervention (N=691) |      | p      |
|--|------------------|------|----------------------|------|--------|
|  | n                | %    | n                    | %    |        |
| <b>Q6. I am confident I can help my child develop healthy eating habits.</b> |                  |      |                      |      |        |
| Strongly Agree   | 918              | 75.5 | 478                  | 71.4 | 0.02*  |
| Agree  | 284              | 23.4 | 182                  | 27.2 |        |
| Neither Agree nor Disagree   | 12               | 1.0  | 5                    | 0.8  |        |
| Disagree   | 0                | 0.0  | 4                    | 0.6  |        |
| Strongly Disagree  | 1                | 0.1  | 0                    | 0.0  |        |
| <b>Q12. During WIC sessions, I feel like we have a good talk.</b>            |                  |      |                      |      |        |
| Strongly Agree   | 732              | 59.1 | 398                  | 58.4 | 0.07** |
| Agree  | 457              | 36.9 | 258                  | 37.9 |        |
| Neither Agree nor Disagree   | 45               | 3.6  | 22                   | 3.2  |        |
| Disagree   | 5                | 0.4  | 0                    | 0.0  |        |
| Strongly Disagree  | 0                | 0.0  | 3                    | 0.5  |        |
| <b>Q16. The nutrition information WIC staff provides is relevant to me.</b>  |                  |      |                      |      |        |
| Strong Agree   | 655              | 56.3 | 347                  | 52.6 | 0.08** |
| Agree  | 470              | 40.4 | 284                  | 43.0 |        |
| Neither Agree nor Disagree   | 35               | 3.0  | 25                   | 3.8  |        |
| Disagree   | 4                | 0.3  | 1                    | 0.1  |        |
| Strongly Disagree  | 0                | 0.0  | 3                    | 0.5  |        |

\*Significant at  $p < .05$ , chi-square test/exact permutation test

\*\*Significant at  $p < .10$ , chi-square test/exact permutation test

**Table 8. Significant Group Differences in Follow-up Responses of WIC Staff (n=84)**

|   | Control (N=41) |      | Intervention (N=43) |      | p      |
|---|----------------|------|---------------------|------|--------|
|   | n              | %    | n                   | %    |        |
| <b>Q9. I feel comfortable using a variety of tools to assess my clients' needs.</b> |                |      |                     |      |        |
| Strongly Agree  | 26             | 63.4 | 13                  | 30.2 | 0.003* |
| Agree   | 15             | 36.6 | 25                  | 58.4 |        |
| Neither Agree nor Disagree  | 0              | 0.0  | 5                   | 11.6 |        |
| Disagree  | 0              | 0.0  | 0                   | 0.0  |        |
| Strongly Disagree   | 0              | 0.0  | 0                   | 0.0  |        |
| <b>Q28. I think my clients are doing the best they can as parents.</b>              |                |      |                     |      |        |
| Strongly Agree  | 4              | 9.8  | 12                  | 27.9 | 0.10** |
| Agree   | 28             | 68.3 | 27                  | 62.8 |        |
| Neither Agree nor Disagree  | 8              | 19.5 | 4                   | 9.3  |        |
| Disagree  | 1              | 2.4  | 0                   | 0.0  |        |
| Strongly Disagree   | 0              | 0.0  | 0                   | 0.0  |        |

\*Significant at  $p < .05$ , chi-square test/exact permutation test

\*\*Significant at  $p < .10$ , chi-square test/exact permutation test

**Table 9. Follow-up Summary and Subscale Scores of WIC Participants (n=2002)**

|  | Control (n=1311) |          |      | Intervention (n=691) |          |      | p    |
|--|------------------|----------|------|----------------------|----------|------|------|
|  | Mean             | Adjusted | SD   | Mean                 | Adjusted | SD   |      |
| <b>Overall Satisfaction Score</b><br>(Q25)                   | 1.45             | N/A      | 0.58 | 1.44                 | N/A      | 0.60 | 0.56 |
| <b>Item Summary Score</b><br>(Q6-Q24)                        | 28.03            | 1.48     | 8.80 | 28.37                | 1.49     | 8.43 | 0.40 |
| <b>Client Provider Communication</b><br>(Q9,Q10,Q12,Q14-Q19) | 12.78            | 1.42     | 3.89 | 12.88                | 1.43     | 4.03 | 0.58 |
| <b>Self-Efficacy Score</b><br>(Q6,Q7)                        | 2.63             | 1.32     | 0.86 | 2.69                 | 1.35     | 0.88 | 0.18 |
| <b>Connectedness to WIC Score</b><br>(Q23-Q25)               | 5.07             | 1.69     | 1.81 | 5.04                 | 1.68     | 1.86 | 0.75 |
| <b>Likability Score</b><br>(Q20,Q21)                         | 3.16             | 1.58     | 1.13 | 3.13                 | 1.57     | 1.18 | 0.61 |
| <b>Emotion Based Score</b><br>(Q11,Q13)                      | 2.98             | 1.49     | 1.12 | 3.01                 | 1.51     | 1.14 | 0.63 |

*T- test used to evaluate group differences*

*Mean adjusted scores = total score/# items; adjusted score 1 = 'strongly agree', 2 = 'agree', etc.*

**Table 10. Follow-up Summary and Subscale Scores of WIC Staff (n=84)**

|   | Control (n=41) |          |       | Intervention (n=43) |          |      | p    |
|---|----------------|----------|-------|---------------------|----------|------|------|
|   | Mean           | Adjusted | SD    | Mean                | Adjusted | SD   |      |
| <b>Overall Satisfaction</b><br>(Q31)                              | 1.66           | N/A      | 0.57  | 1.63                | N/A      | 0.58 | 0.81 |
| <b>Item Summary Score</b><br>(Q6-Q30)                             | 43.03          | 1.72     | 10.10 | 43.76               | 1.75     | 9.62 | 0.74 |
| <b>Client Provider Communication</b><br>(Q12-Q15,Q17-Q19,Q22-Q24) | 17.88          | 1.79     | 4.59  | 17.81               | 1.78     | 3.87 | 0.95 |
| <b>Self-Efficacy</b><br>(Q6-Q11,Q26-Q28)                          | 15.15          | 1.68     | 3.16  | 15.35               | 1.70     | 3.63 | 0.79 |
| <b>Connectedness to WIC</b><br>(Q29-Q31)                          | 5.39           | 1.80     | 1.76  | 5.21                | 1.74     | 1.54 | 0.62 |
| <b>Likability</b><br>(Q20,Q21)                                    | 3.26           | 1.63     | 1.07  | 3.52                | 1.76     | 1.11 | 0.27 |
| <b>Emotion Based</b><br>(Q16,Q25)                                 | 3.37           | 1.69     | 1.09  | 3.56                | 1.78     | 1.10 | 0.42 |

*T- test/Wilcoxon Rank Sum test used to evaluate group differences*

*Mean adjusted scores = total score/# items; adjusted score 1 = 'strongly agree', 2 = 'agree', etc.*

## Discussion

The baseline survey results indicated that responses from both WIC participants and staff were positive regarding the five main constructs measured (client-provider communication, parental or staff self-efficacy, connectedness to WIC, likability and emotion-based themes). There were few significant differences in survey responses between intervention and control groups at baseline for both WIC participants and staff. With regards to perceiving the nutrition information provided by WIC staff as relevant, a slightly greater percentage of participants in intervention sites responded “neither agree nor disagree” compared with participants in control sites. With regards to perceiving overall rapport with WIC clients as high, a greater percentage of staff in control sites responded “neither agree nor disagree” or “strongly disagree” compared staff responses in the intervention sites.

MDPH and HSPH presented baseline findings at the annual USDA FNS WIC Special Project Grants conference in May 2009. Evaluators from other states with similar projects also found the majority of WIC participants to report high satisfaction with the WIC assessment sessions pre-intervention.

Since the majority of WIC participants and staff in both intervention and control sites reported “agree” or “strongly agree” to positive statements regarding the constructs measured at baseline, there was little room for improvement in positive responses on post-test surveys completed by participants and staff in either intervention or control sites. However, change toward neutral or negative opinions would have been possible. As expected, we found few significant differences at follow-up in comparisons of WIC participants and WIC staff by group assignment. In analyses comparing intervention and control sites at follow-up (e.g., post-test), there were few significant differences, as a large percentage of both WIC staff and participants reported “agree” or “strongly agree” to

positive statements regarding the constructs measured. Among WIC participants, a slightly lower percentage of those in the intervention sites reported “strongly agree” in response to feeling confident in helping their child develop healthy eating habits compared to the control group. There were marginally significant differences in how WIC participants perceived the relevance of nutrition information that WIC staff provide and having a “good talk” during WIC sessions, with slightly higher percentages in the intervention group reported “strongly agree” than in the control group ( $p=0.08$  and  $p=0.07$ , respectively). Among WIC staff, the control group had a higher percentage (63.4%) of responding “strongly agree” to feeling comfortable using a variety of tools to assess their clients’ needs compared to 30.2% in intervention group ( $p=0.003$ ). 27.9% of WIC staff in intervention sites strongly agreed that their clients are doing the best they can as parents compared to 9.8% of staff in the control groups ( $p=0.10$ ). The statistical significance of findings related to WIC staff is limited by small sample size.

In analyses examining the change from pre-test to post-test in overall satisfaction, and summary scores overall and by theme, there were no significant differences over time or between intervention and control groups for either WIC staff or WIC participants.

Several possible explanations for findings exist. The baseline findings may reflect a positive assessment by participants and staff of the Massachusetts WIC Program on the themes related to provider-client interactions that were assessed in the GHM evaluation. Since these findings did not change at follow-up in cross-sectional or change analyses, it can be concluded that the GHM intervention did not adversely affect these positive perceptions among participants and staff. Baseline findings also might reflect the statewide implementation of the Touching Hearts and Touching Minds nutrition education intervention implemented previously by the Massachusetts WIC Program that incorporated emotion-based approaches into counseling (Colchamiro et al., 2010). Thus, the baseline

assessments could reflect a positive perception of the WIC provider-client relationship due to THTM. Statewide implementation of VENA in 2007 led to the omission of a full-length food frequency questionnaire and the inclusion of open-ended questions on behaviors related to food group intake, breastfeeding and food security. Changes in the nutrition assessment process due to VENA could have affected the quality of the conversation and interaction of WIC providers and participants and thus have contributed to the positive baseline assessments. Immediately following the baseline survey administration in the Fall 2008, the Massachusetts WIC Program also implemented the changes in the WIC Food Package (Food and Nutrition Board, 2005), which could have influenced perceptions at follow-up either positively or negatively.

The findings in the report must be interpreted in light of several strengths and limitations. Strengths of this study include matching intervention and control sites on size, cultural diversity, and urbanicity, thereby reducing these variables' effects as potential confounders on the study's findings. Geographical spacing of WIC sites across Massachusetts reduced the possibility of contamination between intervention and control sites. To our knowledge, administration of complementary surveys on parallel constructs to both WIC participants and staff to assess any discrepancies in perceptions of client-provider communications has not been addressed in previous studies.

Results from this study may not be generalizable to other study populations, such as WIC programs and participants outside of Massachusetts. A primary limitation of the study's quasi-experimental study design is the lack of randomization to assign intervention and control sites. Thus, differences in characteristics of intervention and control WIC sites might have influenced findings. For example, WIC sites that were pre-selected by Massachusetts WIC Program state-level staff as intervention sites may have had more resources or greater staff motivation to implement the intervention. WIC staff and WIC

participants who completed surveys may be systematically different than those who did not agree to participate (selection bias). Such differences in participant samples may produce post-test outcome differences even in the absence of an intervention (Shadish et al., 2002). In addition, the quasi-experimental design used for the GHM evaluation did not permit longitudinal tracking of WIC participants. Thus, socio-demographic characteristics of the follow-up sample of WIC participants were somewhat different from those completing the baseline survey and could have contributed to differences in response. Other threats to the validity of the study's findings include experimenter expectancies (e.g., WIC staff at intervention sites may be influenced by expectations of desired responses when completing the posttest surveys) and compensatory rivalry and equalization (e.g. WIC staff at control sites, who are aware that they have not been selected to receive the intervention, may be motivated to show that their staff are just as capable in terms of counseling skills and using emotion-based techniques in communications by engaging their clients more than usual during nutritional assessments). Alternatively, at post-test, WIC staff could have downgraded their assessment of their ability to have meaningful conversations with WIC participants after receiving training and utilizing GHM nutrition assessment strategies, if these activities changed their expectations of the client-provider interaction.

The uniform pre-test to post-test findings from WIC staff and WIC participants highlight the value of using a mixed-methods approach for the GHM evaluation. Findings from the qualitative evaluation conducted in April 2010 after the administration of the post-test surveys, e.g., focus groups for the WIC participants and in-depth interviews with staff, are summarized elsewhere.

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## **APPENDICES**

## Appendix 1

### Getting to the Heart of the Matter: Evaluation Timeline

#### Year 1

##### Intervention Development (McCarthy and Associates)

- Ethnographic Research
- Focus Groups
- GHM Intervention Development

##### Baseline Evaluation (HSPH)

- Pre-Pilot Surveys [Pilot Intervention Sites; Control Sites]
  - WIC Participants
  - WIC Staff

#### Year 2

- Pilot emotion-based assessment tools and techniques in GHM Intervention Sites

#### Year 3

##### Mixed Method Evaluation (HSPH)

- Post-Pilot Surveys [Pilot Intervention Sites; Control Sites]
  - WIC Participants
  - WIC Staff
- Independent Qualitative Evaluation [Pilot Intervention Sites only]
  - In-Depth Interviews with WIC Staff
  - Focus Groups with WIC Participants

##### Intervention Refinement

- Ethnographic Research (McCarthy Associates)
- Final Strategies and Techniques

**Appendix 2**  
**Getting to the Heart of the Matter: Survey Constructs and Items**

| Construct                             | Original Survey Items/Constructs   | GHM Items   |
|---------------------------------------|--|---|
| <p><i>Parenting self-efficacy</i></p> | <p><u>Campbell et al., 2006</u><br/>           I feel confident to cook a wide range of foods<br/>           I feel confident cooking new dishes and trying new recipes<br/>           I enjoy cooking for the family</p> <p>Family food environment and dietary behaviors likely to promote fatness in 5-6 year-old children. <i>Int J Obes (Lond)</i>. 2006 Aug;30(8):1272-80.</p> <p><u>Whitaker et al., 2004</u><br/>           [You] model poor eating habits<br/>           [You] are letting your children decide what to eat and giving them too much control over food choices</p> <p>Extended family members play an important role in feeding decisions</p> <p>Findings from Pam McCarthy's ethnographic report</p> | <p><u>GHM Client Survey</u><br/>           6. I feel confident I can help my child develop healthy eating habits.</p> <p>7. WIC staff help me feel more confident in feeding my child well.</p> <p><u>GHM Staff Survey</u><br/>           26. I believe my WIC clients are capable of making changes.<br/>           27. I believe WIC clients make changes based on our interaction.<br/>           28. I think my WIC clients are doing the best they can as parents.</p> |
| <p><i>Staff self-efficacy</i></p>     | <p><u>Shore &amp; Franks 1986 (Professional)</u><br/>           Q2. I think I really understood why this patient came here today.</p> <p>Q5. I helped this patient today.</p> <p>Q25. After this encounter, I think I have a good understanding of what is going on.</p>   | <p><u>GHM Staff Survey</u><br/>           6. I think I really understand why WIC clients come to see me.</p> <p>10. I guide WIC clients to solutions regarding their child feeding concerns.</p> <p>7. After meeting with WIC clients, I think I have a good understanding of how they feed their child.</p>  |

|   |  |   |
|---|--|---|
|   | <p>Q28. I believe I can be of help to this patient.</p> <p>Q32. I did not use my time with the patient very effectively today.</p> <p>Q37. This patient's problem was one I feel competent to handle.</p> <p>Appears to be validated - Quantitative data collection instruments were developed based on findings from the formative research [44], as well as related studies documented in the literature. The instruments were pre-tested and modified accordingly.</p>                    | <p>9. I feel comfortable using a variety of nutrition assessment tools to determine my clients' needs.</p> <p>11. I use my time with WIC clients effectively.</p> <p>8. I feel competent to handle WIC clients' child feeding concerns.</p>   |
| <p><i>Client-provider communication</i></p> | <p><u>Shore &amp; Franks 1986</u><br/><u>(Interpersonal)</u></p> <p>Q1. This patient was able to explain his or her problems in terms I could understand.</p> <p>Q8. The patient seemed satisfied with how things went.</p> <p>Q10. This patient understood what I said.</p> <p>Q12. This patient was able to be very open with me.</p> <p>Q14. This patient basically disagreed with my explanations and plans.</p> <p>Q22. I don't believe this patient appreciated my efforts at all.</p> | <p><u>GHM Client Survey (GHM Staff Survey)</u></p> <p>22. WIC staff asks me questions to help me talk about my concerns. (13. WIC clients explain their child feeding concerns in terms I can understand.)</p> <p>17. The sessions with the WIC staff are worth my time. (17. WIC clients seem satisfied with my nutrition counseling.)</p> <p>9. The WIC staff really understand why I come to WIC. (14. WIC clients understand what I say.)</p> <p>10. I am able to be very open with WIC staff. (15. WIC clients are able to be very open with me.)</p> <p>14. The WIC staff value my ideas on how to feed my child. (12. My counseling is meaningful to WIC clients.)</p> <p>16. The nutrition information that the WIC staff provides is relevant to me.</p> <p>18. I appreciate the WIC staff's efforts. (18. I believe that WIC clients appreciate my efforts.)</p> <p>19. I respect the WIC staff. (19. I believe that WIC clients respect me.)</p> |

|  |   |  |
|--|---|--|
|  | <p>24. This patient gave me a clear idea of how today's problems affected his or her life.</p> <p>Q39. Overall rapport with this patient was very high.</p> <p><u>Additional Questions From Weinberger et al.18</u><br/> Q17. I was very active in this encounter.<br/> Q21. I believe this patient is generally compliant.<br/> Q29. I needed to make many facilitative remarks in this encounter.<br/> Q33. Humor was used during this encounter<br/> -Validated, used in Newes-Adeyi study</p> | <p>15. The WIC staff helps me with my concerns about feeding my child. (22. WIC clients give me a clear idea of how their concerns about feeding their child affect their life.)</p> <p>12. During my sessions with WIC, I feel like we have a good talk. (23. My overall rapport with WIC clients is generally very high.)</p> <p><u>GHM Staff Survey</u><br/> 24. The time I spend with WIC clients feels like a conversation.</p> |
| <p><i>Organizational connectedness</i></p> | <p><u>Add Health</u></p> <p>1. How much do you feel that the WIC staff care about you?</p> <p>(How much do you agree or disagree with the following:)<br/> 2. You feel close to the staff at your WIC clinic.</p> <p>3. You are happy to be a part of the WIC program.</p> <p>#1-3 are adapted from Add Health survey questions on school connectedness, validated</p>  | <p><u>GHM Client Survey (GHM Staff Survey)</u></p> <p>25. Overall, I am satisfied with my relationship with the WIC staff. (31. Overall, I am satisfied with my relationship with WIC clients.)</p> <p>23. I feel close to the staff at my WIC Program. (29. I feel close to the clients at my WIC Program.)</p> <p>24. I feel connected to the WIC program. (30. I feel connected to the WIC program.)</p>                          |
| <p><i>Likability</i></p>                   | <p><u>Hall et al. 2002</u><br/> (How much do you agree or disagree with the following:)<br/> - All in all, I like this patient/doctor a lot</p> <p>- This patient/doctor likes me a lot</p>   | <p><u>GHM Client Survey (GHM Staff Survey)</u><br/> 20. All in all, I like the WIC staff a lot. (20. All in all, I like my WIC clients.)</p> <p>21. I think the WIC staff like me a lot. 21. (I think WIC clients like me a lot.)</p>  |

|   |   |  |
|---|---|--|
| <p><i>Emotion-based Connectedness</i></p> | <p>Findings from Pam McCarthy's ethnographic report</p> | <p><u>GHM Client Survey (GHM Staff Survey)</u></p> <p>11. Emotionally, I feel very comfortable talking to the WIC staff. (16. <i>Emotionally, I feel very comfortable talking with WIC clients.</i> 25. <i>I talk with my clients on an emotional level.</i>)</p> <p>13. When I go to my WIC appointment, I feel like WIC staff take the time to see what happened at my last visit.</p> |
|---|---|--|

**Appendix 3**

**Massachusetts WIC Program**

**Parent Survey**

**We need your help to improve your experience here at WIC. Please take a few minutes to fill in the answers to the questions below. There are no right or wrong answers and your name will not be attached to the survey... so please answer honestly!**

### **Section 1. ABOUT YOU**

1. How old are you?  18-25  26-35  36+
2. What is your sex?  Female  Male
3. Were you born in the United States?  Yes  No
4. What language do you usually speak at home? (*Please check ONE*)  
 English  
 Spanish  
 Portuguese  
 Other (please describe): \_\_\_\_\_
5. Are you: (*Check all that apply*)  
 Hispanic or Latina  
 Black or African American  
 White  
 Asian or Pacific Islander  
 American Indian  
 Other (*Please describe*): \_\_\_\_\_

### **Section 2. ABOUT CHILD FEEDING AND WIC**

*Check how strongly you agree or disagree with each statement below. Please mark only ONE box for each statement. There is no right or wrong answer, so please answer as honestly as you can.*

6. I feel confident I can help my child develop healthy eating habits.  
 Strongly Agree  
 Agree  
 Neither Agree nor Disagree  
 Disagree  
 Strongly Disagree
7. WIC staff help me feel more confident in feeding my child well.  
 Strongly Agree  
 Agree  
 Neither Agree nor Disagree  
 Disagree  
 Strongly Disagree

8. The WIC staff believe that I am doing the best job I can as a parent.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

9. The WIC staff really understand why I come to WIC.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

10. I am able to be very open with WIC staff.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

11. Emotionally, I feel very comfortable talking to the WIC staff.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

12. During my sessions with WIC, I feel like we have a good talk.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

13. When I go to my WIC appointment, I feel like WIC staff take the time to see what happened at my last visit.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

14. The WIC staff value my ideas on how to feed my child.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

15. The WIC staff helps me with my concerns about feeding my child.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

16. The nutrition information that the WIC staff provides is relevant to me.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

17. The sessions with the WIC staff are worth my time.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

18. I appreciate the WIC staff's efforts.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

19. I respect the WIC staff.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

20. All in all, I like the WIC staff a lot.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

21. I think the WIC staff like me a lot.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

22. WIC staff asks me questions to help me talk about my concerns.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

23. I feel close to the staff at my WIC Program.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

24. I feel connected to the WIC program.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

25. Overall, I am satisfied with my relationship with the WIC staff.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

**You have completed the survey.  
We thank you for your time. Your response is  
important to us.**

**Appendix 4**

Subject ID #: \_\_\_\_\_

**Massachusetts WIC Program  
Staff Survey**

**We need your help to understand your and your clients' experiences here at WIC. Please take a few minutes to answer the questions below. There are no right or wrong answers and your name will not be attached to the survey... so please answer honestly!**

**Section 1. ABOUT YOU**

1. How old are you?  18-25  26-35  36+

2. Were you born in the United States?  Yes <sup>(1)</sup>  No <sup>(2)</sup>

3. What language do you usually speak at home? *(Please check ONE)*

English <sup>(1)</sup>

Spanish <sup>(2)</sup>

Other <sup>(3)</sup> *(please describe)*: \_\_\_\_\_

4. Are you: *(Check all that apply)*

Hispanic or Latina <sup>(1)</sup>

Black or African American <sup>(2)</sup>

White <sup>(3)</sup>

Asian or Pacific Islander <sup>(4)</sup>

American Indian <sup>(5)</sup>

Other <sup>(6)</sup> *(Please describe)*: \_\_\_\_\_

5. What type of WIC staff are you? *(Please check one)*

Program Senior/Nutritionist <sup>(1)</sup>

Nutrition Assistant <sup>(2)</sup>

Other <sup>(3)</sup> *(please describe)*: \_\_\_\_\_

**Section 2. ABOUT YOUR INTERACTIONS and EXPERIENCES AT WIC**

Check how strongly you agree or disagree with each statement below. Please mark only ONE box for each statement. Remember, there is no right or wrong answer and your name will not be linked to the survey.

|  | Strongly<br>Agree <sup>(1)</sup> | Agree <sup>(2)</sup>     | Neither<br>Agree nor<br>Disagree<br><sup>(3)</sup> | Disagree<br><sup>(4)</sup> | Strongly<br>Disagree <sup>(5)</sup> |
|--|----------------------------------|--------------------------|--|----------------------------|-------------------------------------|
| 6. I think I really understand why WIC clients come to see me.                                       | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/>                           | <input type="checkbox"/>   | <input type="checkbox"/>            |
| 7. After meeting with WIC clients, I think I have a good understanding of how they feed their child. | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/>                           | <input type="checkbox"/>   | <input type="checkbox"/>            |
| 8. I feel competent to handle WIC clients' child feeding concerns.                                   | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/>                           | <input type="checkbox"/>   | <input type="checkbox"/>            |

|   | Strongly Agree <sup>(1)</sup> | Agree <sup>(2)</sup>     | Neither Agree nor Disagree <sup>(3)</sup> | Disagree <sup>(4)</sup>  | Strongly Disagree <sup>(5)</sup> |
|---|-------------------------------|--------------------------|---|--------------------------|----------------------------------|
| 9. I feel comfortable using a variety of nutrition assessment tools to determine my clients' needs.     | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 10. I guide WIC clients to solutions regarding their child feeding concerns.                            | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 11. I use my time with WIC clients effectively.   | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 12. My counseling is meaningful to WIC clients.   | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 13. WIC clients explain their child feeding concerns in terms I can understand.                         | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 14. WIC clients understand what I say.  | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 15. WIC clients are able to be very open with me.   | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 16. Emotionally, I feel very comfortable talking with WIC clients.                                      | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 17. WIC clients seem satisfied with my nutrition counseling.  | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 18. I believe that WIC clients appreciate my efforts.   | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 19. I believe that WIC clients respect me.  | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 20. All in all, I like my WIC clients.  | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 21. I think WIC clients like me a lot.  | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 22. WIC clients give me a clear idea of how their concerns about feeding their child affect their life. | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 23. My overall rapport with WIC clients is generally very high.   | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 24. The time I spend with WIC clients feels like a conversation.  | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 25. I talk with my clients on an emotional level.   | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 26. I believe my WIC clients are capable of making changes.   | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |

|  | Strongly Agree <sup>(1)</sup> | Agree <sup>(2)</sup>     | Neither Agree nor Disagree <sup>(3)</sup> | Disagree <sup>(4)</sup>  | Strongly Disagree <sup>(5)</sup> |
|--|-------------------------------|--------------------------|---|--------------------------|----------------------------------|
| 27. I believe WIC clients make changes based on our interaction.   | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 28. I think my WIC clients are doing the best they can as parents. | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 29. I feel close to the clients at my WIC Program.                 | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 30. I feel connected to the WIC program.                           | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |
| 31. Overall, I am satisfied with my relationship with WIC clients. | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>                  | <input type="checkbox"/> | <input type="checkbox"/>         |

**You have completed the survey.  
We thank you for your time. Your response is  
important to us.**

