TIES Program Evaluation

Effectiveness Study

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Evaluation Narrative Summary

Purpose

The combination of a compromised caregiver and high needs infant can lead to insecure attachment, decreased maternal-infant mutuality, higher parenting stress, and possibly decreased infant cognitive development (Suchman et al., 2006). Children with healthy primary caregiving relationships are more likely to develop a foundation for positive social interactions with others and stronger cognitive skills. Mothers affected by substance use disorder often require support in learning to bond and respond effectively to their babies as they may have had limited positive role models for parenting and personal social support and are coping with trauma and resultant substance use disorder and recovery. This study seeks to investigate if there are different parenting practices, child health outcomes, and linkages to community services based on whether a participant receives the TIES (Team for Infants Exposed to Substance Use) Program, a comprehensive and intensive home intervention program, or care-as-usual.

This report describes the Effectiveness Study that is underway, mainly the data collection activities conducted between March 16, 2016, and September 29, 2023, in the treatment group and matched comparison group. The TIES Program focuses on three research questions as following:

a. Are there differences in parenting practices between participants who receive the TIES Program intervention and participants who receive care-as-usual?
b. Are there differences in child health outcomes between participants who receive the TIES Program intervention and participants who receive care-as-usual?
c. Are there differences in linkages and referrals to community services between participants who receive the TIES Program intervention and participants who receive care-as-usual?

A quasi-experimental research design was used to address the three research questions due to the non-randomization of the participants in the treatment group and the comparison group. This report presents the comprehensive results using the comparison group completers and the treatment group completers after matching participants' baseline characteristics.

Activities

The major evaluation activity was completing the data collection with the comparison group participants and with the TIES treatment group. By November 2023, all data points were collected from the comparison group. Therefore, this report includes a full analysis of the effectiveness study including all the data points collected from the comparison group and TIES treatment group.

Adherence to the workplan

The adjusted timeline to collect all three data points from comparison group participants is the only

deviation. The recruitment and retention of the comparison group has faced the greatest difficulty, particularly during the pandemic. The challenges encountered were mainly to get hold of participants and ensure data point was not missed from the comparison group. Another challenge has to do with staff turnover.

Lessons learned

Recruitment of the comparison group stopped in May 2022 to wrap up this study. One lesson learned was with the comparison group recruitment. Given the reliance on incentives for recruiting new participants, the timely procurement of these incentives is crucial. Some strides were made to remedy this barrier. The greatest recruitment success has been from the unitizing snowball sampling method by asking current and graduating matched comparison group participants to identify other potential participants. Continued efforts were made to identify new avenues for recruitment, including exploring statewide partnerships.

Evaluation Technical Report

Evaluation questions addressed

This report addressed three research Questions listed on page 1.

Methods

Design/Procedures

We used an unpaired t-test to test whether mean scores differ across treatment groups and data-collection time points. A folded F-test was used to estimate whether the variance was equal across the two groups being compared by the t-test. When the variances of the two groups were found to be equal, the t-test used a pooled variance in its calculation. Otherwise, the t-test used the Welch/Satterthwaite-based variance in its calculation. Because the sample for some variables collected on the comparison group at a particular data collection timepoint was occasionally smaller than might be appropriate for a t-test, we also ran Mann-Whitney U (MWU) tests as another comparison of central tendency for comparison purposes. A bootstrap estimation process was also employed as another method to compare how the mean score of a variable changed from the first data collection timepoint to the third. The bootstrap process uses 10,000 random draws with replacement from the observed distributions of data and we report the mean change in scores between times 1 and 3 along with 95% confidence intervals for this mean change.

Multi-level models (MLM) were also conducted to estimate the impact of TIES treatment and demographic factors on the outcome measures. The MLMs include a random intercept for each participant and an unstructured covariance matrix to allow maximum flexibility in the model specification. Because the dependent variables are often not normally distributed and sometimes have relatively small sample sizes at a given cluster (time period), we also estimated Generalized Estimating Equation (GEE) models that are more robust to such conditions than MLM, in addition to being more robust to model misspecification (Vagenas

& Totsika, 2018). Each GEE model employs an identity link function and an unstructured working correlation matrix. Detailed descriptions of the fixed effects were included in each model followed in the sections below.

All data manipulation and model estimation were performed in SAS 9.4. MLM and GEE are estimated using the MIXED and GENMOD procedures respectively. The general process for specifying a model began by including all possible demographic variables in a model along with other relevant variables such as treatment group indicator, covid period indicator, and continuous time variable, and then dropping variables from a model that are not statistically significant (p-value > 0.05) on an iterative basis until all remaining predictors are statistically significant.

Sample Characteristics

The sample used in this analysis includes 273 participants from the treatment group (TIES program participants), and 70 participants (excluding 4 contaminated with the treatment group, and 2 early discharged without data) from the comparison group. The treatment group excludes TIES participants who exited the program before March 16, 2016 and excludes observations obtained before March 16, 2016, or after September 29, 2023, in order to be consistent with the grant cycle. The comparison group includes all available participants who enrolled starting in April 2016. Table 1 provides descriptive statistics of the comparison group and TIES treatment group.

We collected data on the mother's age, the number of children to which the mother has access, and other demographic factors at program intake (pregnancy status, race, ethnicity, marital status, education, housing, employment, and state of residence). We ran an unpaired t-test between the comparison group and the treatment group for the mother's age and number of children with p-values (Table 1). We found no statistically significant differences between the two groups for these two variables. We also ran $\chi 2$ tests of association between the comparison group and the treatment group for each of the categorical demographic variables, finding some associations between the two groups concerning race, ethnicity, housing, employment, and state of residence. There are some differences in the demographic characteristics of the two groups, and these differences inform how models are specified to address the research questions in the analysis.

Table 1. Demographics of the comparison group and the treatment group

	Comparison (N=70)		Treatment (N=273)		p-value*
Age (mean, SD)	27.6	5.1	28.8	5.0	0.09
Number of Children (mean, SD)	1.9	1.6	1.8	1.5	0.57
Pregnant at Intake (N, %)					0.15
Yes	22	31%	116	42%	
No	45	64%	157	58%	
Race (N, %)					0.03
Black	33	47%	82	30%	
White	30	43%	158	58%	
Other	4	6%	19	7%	
Ethnicity (N, %)					0.01

Hispanic/Latino	1	1%	30	11%	
Non-Hispanic/Latino	66	94%	229	84%	
Marital Status (N, %)					0.21
Single	49	70%	207	76%	
Not Single	18	26%	51	19%	
Education (N, %)					0.43
HS Diploma or More	42	60%	148	54%	
Less than HS Diploma	25	36%	110	40%	
Housing Status (N, %)					0.00
Stable	63	90%	195	71%	
Unstable	3	4%	54	20%	
Employment (N, %)					0.00
Employed	28	40%	37	14%	
Not Employed	39	56%	222	81%	
State (N, %)					0.00
KS	13	19%	124	45%	
MO	56	80%	149	55%	

* P-values from t-test for continuous variables; from χ^2 test for categorical variables.

Data/Measures

Assessments and interview processes are used to collect primary data from study participants, which includes the following formal instruments and TIES Effectiveness Study documentation. Secondary data include documentation of completed well-child visits and immunizations. The following measures addressed the Effectiveness Study research questions:

- **Parenting Practices regarding Relationship with the Child:** Positive Parenting Goal 2 of the TIES Goal Attainment Scale (Chiang, et al., 2021), Relationships with Child(ren) Scale of the Life Skills Progression (LSP) (Wollesen & Peifer, 2008), and AAPI-2;
- **Parenting Practices regarding Child Health:** Child Health Goal 3 of the TIES Goal Attainment Scale, Health and Medical Care Scale of the LSP, and TIES Effectiveness Study Child Health Care Visit History; and
- **Linkages and Referrals to Community Services:** Relationships with Supportive Resources Scale of the LSP and TIES Effectiveness Study Referral Documentation.

The Individualized Family Service Plan (IFSP) Goal Attainment Scale. The TIES IFSP goal attainment scale (Chiang, et al., 2021) consists of a 5-point Likert scale that assesses and tracks participants' goal attainment over time in the following areas: maternal substance use, parenting skills, child physical and mental health, maternal physical and mental health, income stability, and housing stability. Plans are individualized, and families and specialists mutually agree on goals based on specific needs. The tool details the plan for service delivery, and supportive activities provided during home visits enhance participants' abilities to work towards the established goals. The home visitors and families develop these goals together and jointly score goals and track progress using the IFSP goal attainment scale. TIES specialists score the family's status in goal areas at intake (Time 1) and discharge (Time 5), and, together with the family, track

progress over time at the child's age of 3–7 months (Time 2), 9–13 months (Time 3), and 18–22 months (Time 4). On the five-point Likert scale, 1 represents very low (crisis); 2, low (vulnerable); 3, adequate (stable); 4, high (advanced); and 5, very high (thriving). Goal areas are scored by calculating a mean score from subscale items.

Life Skills Progression (LSP). The LSP (Wollesen & Peifer, 2008) is a validated tool for measuring progress in one or more areas of families' lives. The 15-item modified LSP proposed in this study includes only selected items that cover areas in 1) parents' relationships with children, 2) health and medical care, and 3) relationships with supportive resources. In terms of reliability, Cronbach's Alpha (Cronbach, 1951) ranges from 0.78 to 0.90, which is very good. Construct validity was examined by administering the LSP to two different programs over 12 months and internal consistency ranged between 0.64 and 0.98 (acceptable to excellent). Content validity was evaluated by an expert advisory review panel of five ZERO TO THREE Fellows in 2003 (Wollesen & Peifer, 2008). The TIES support specialists scored the LSP items by considering in-depth information about the family through referral information, encounters, conversations, observations, and/or other formal screening tools (i.e., ASQ-3 and ASQ-SE). LSP data was collected three times per participant throughout the study - intake, 6 months, and 12 months.

The Adult-Adolescent Parenting Inventory-2 (AAPI-2). The Adult-Adolescent Parenting Inventory -2 (AAPI-2) was designed to assess parenting attitudes, measure the effectiveness of treatment, and identify parents who are at risk for abusive or neglectful behaviors (Bavolek & Keene, 2001). The measure consists of five domains in 40 items on a 5-point Likert scale from strongly disagree (5) to strongly agree (1) with unsure (3) as the center anchor. Interpretation of the AAPI-2 relies on converting subscale sum scores to STEN scores (standardized ten) using norm tables. According to the authors, low STEN scores (1-4) reflect attitudes consistent with elevated risk for abusive parenting behaviors. High STEN scores (7-10) indicate a "non-abusive parenting philosophy" (p.22). The internal consistency of the scale is .85, with the coefficients for subscales ranging from .50 to .79 (Conners, et al., 2006).

Study data was collected and managed using REDCap (Research Electronic Data Capture) electronic data capture tools hosted at Children's Mercy Hospital and the University of Missouri-Kansas City (UMKC). REDCap is a secure, web-based software platform designed to support data capture for research studies and is a HIPAA-compliant, password-protected database.

TIES goal attainment scales and LSP scales are rated by FSS for the treatment group, and by the evaluation team for the comparison group. AAPI-2 data and well-child visits for both the treatment group and the comparison group were self-reported. Referral documentation was recorded and tracked by TIES FSS and the evaluation team for the treatment group and the comparison group respectively.

Table 2. TIES Effectiveness Study Data Collection

Research Question	Assessment Tools	Collection Intervals
Are there differences in parenting practices between participants who receive the TIES Program intervention and participants who	TIES Goal Attainment Scale (Goal 2) Life Skills Progression – Relationships with Child(ren) Scale	All assessments are to be collected at the following intervals: Child age of birth to 6 months

receive care-as-usual?	Adult and Adolescent Parenting Inventory-2 (AAPI-2)	Child age of 6 to 12 months Child age of 12 to 18 months
Are there differences in child health outcomes between participants who receive the TIES Program intervention and participants who receive care-as-usual?	TIES Goal Attainment Scale (Goal 3) Life Skills Progression – Health and Medical Care Scale TIES Effectiveness Study Child Health Care Visit History	
Are there differences in linkages and referrals to community services between participants who receive the TIES Program intervention and participants who receive care-as-usual?	Life Skills Progression – Relationships with Supportive Resources Scale TIES referral documentation TIES Effectiveness Study Referral Documentation	

Analysis

Detailed analysis design, rationale, and plan were discussed above in the "Design/Procedures" section on pages 2-3. Additional descriptions of the analysis employed for each research question are included in the results section.

Results

Summary of key findings

The primary key finding is that the TIES Program is effective. The final comprehensive analysis using the TIES goal attainment scale and life skills progression, both of which are validated, indicated that the TIES Program is effective. There were differences in parenting practices regarding interaction with the child, child health outcomes, and linkage to community services between participants who received the TIES Program intervention and participants who received care as usual. Participants who received the TIES Program intervention showed a statistically significant improvement over time and were able to maintain their skills in parenting, whereas participants who received care-as-usual showed a little improvement and even a trend in regressing in parenting skills as their children grew older. Likewise, families who received the TIES Program showed significant progress in child health goal, whereas families in the care-as-usual group showed a tendency to decline in the same goal. In addition, families who received the TIES Program demonstrated progress in relationships with workers and use of resources/information, whereas families in the care-as-usual group showed a tendency to decline in these areas.

Results for each evaluation question

Research Question 1: Are there differences in parenting practices regarding interaction with the child between participants who receive the TIES Program intervention and participants who receive care as usual?

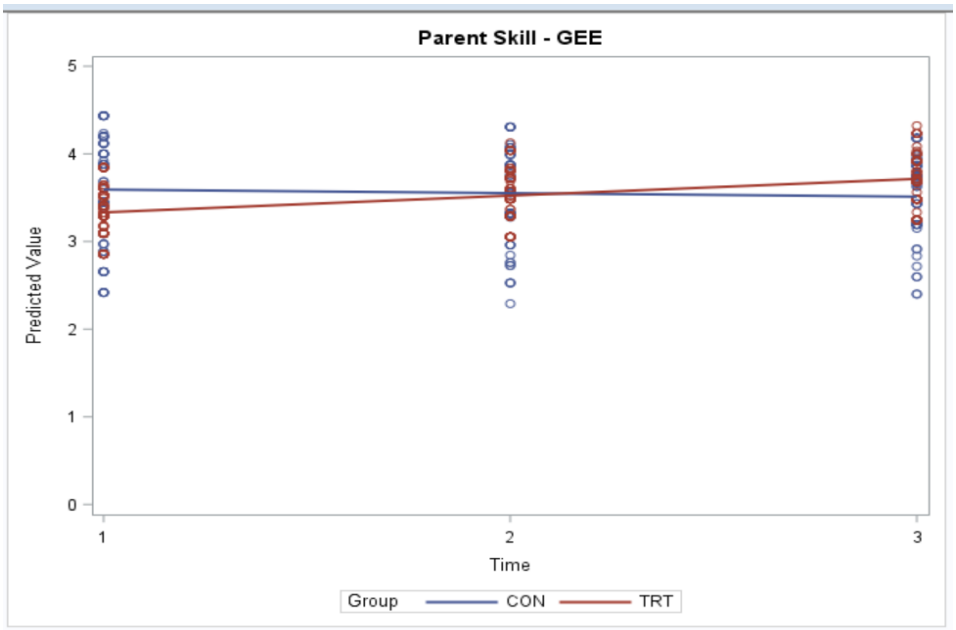
IFSP Parenting Goal results

The Positive Parenting Goal of the TIES Goal Attainment Scale, the Relationships with Child(ren) Scale of the LSP, and the AAPI-2 are the primary data sources for this research question. We began by estimating MLM and GEE models to estimate the impact that being in the TIES treatment group has on IFSP parenting skill scores after controlling for various demographic factors with results appearing in Table 3. The MLM and GEE models suggest that those in the TIES treatment group tend to have parenting skill scores 0.31 ($p<0.001$) and 0.27 ($p<0.001$) units higher compared to the comparison group, indicating that the TIES Program has a meaningful impact on parenting skills goal. Figure 1 shows the predicted trend lines for parenting skill scores at each time point for those in the TIES program versus those in the comparison group. As shown in Figure 1, the treatment group participants showed an upward trend in parenting skill goal scores, while the comparison group did not. The models also suggest that Black/African American participants scored lower than white participants by 0.45 units ($p< 0.001$) in both the treatment group and the comparison group across all three time points. Education attainment (high school diploma or above) and being employed at intake are both estimated to have a positive impact on parenting skill scores. With an additional analysis to examine the impact of COVID-19, the results indicated that the COVID period tend to decrease scores for the comparison group by 0.54 to 0.59 units ($p<0.001$), yet no statistically significant impact on the TIES treatment group.

Table 3. MLM and GEE Output for IFSP Parenting Skill Score

	MLM					GEE			
Parameter	**Estimate**	**StdErr**	**DF**	**tValue**	**Probt**	**Estimate**	**StdErr**	**Z**	**ProbZ**
Intercept	3.81	0.17	218	23.02	0.00	3.82	0.16	24.00	0.00
Treatment	-0.74	0.17	255	-4.22	**0.00**	-0.69	0.17	-4.01	**0.00**
Time	-0.09	0.05	255	-1.83	0.07	-0.09	0.06	-1.35	0.18
Treatment *Time	0.31	0.06	255	4.71	**0.00**	0.27	0.08	3.53	**0.00**
Covid Period*Treatment	-0.10	0.16	255	-0.62	0.54	-0.10	0.15	-0.67	0.50
Covid Period*Comparison	-0.54	0.12	255	-4.51	**0.00**	-0.59	0.14	-4.11	**0.00**
Race (Black)	-0.45	0.11	255	-4.27	**0.00**	-0.45	0.11	-4.20	**0.00**
Race (Other)	-0.25	0.20	255	-1.24	0.22	-0.19	0.16	-1.23	0.22
HS and above	0.24	0.10	255	2.34	**0.02**	0.22	0.10	2.23	**0.03**
Employed	0.35	0.12	255	2.88	**0.00**	0.35	0.11	3.28	**0.00**

Figure 1. Predicted Values of IFSP Parenting Skill Score from GEE Models



The bootstrap procedure estimates that between time 1 and time 3, parenting skill scores in the treatment group increased by 0.37 units with a 95% confidence interval (CI) of (0.14, 0.58). The 95% CI for the comparison group was estimated to be (-0.37, 0.26) indicating no significant impact on parenting skill scores over time (see Table 4).

Table 4. Bootstrap estimates of the mean difference in IFSP parenting skill goal score

Group	Mean Change	SE	2.5 Pctile	97.5 Pctile
Treatment	0.37	0.11	0.14	0.58
Comparison	-0.05	0.16	-0.37	0.26

LSP parenting results

MLM and GEE models were also estimated on five LSP items related to parenting skills (see Table 6). Each of the MLM and GEE models found that LSP-based parenting skill scores trended higher in the TIES treatment group compared to the comparison group with each interaction variable between treatment group and time being statistically significant. From the analysis, the COVID period had a greater negative impact on the comparison group's LSP scores, compared to the treatment group. Specifically, the magnitude of the covid impact on Nurturing scores from the comparison group was greater, with coefficients estimated at -1.03 and -1.06 ($p<0.001$) by MLM and GEE respectively, while the impact of the covid period on "nurturing" scores from the TIES treatment group was at -0.31 and -0.34 ($p= 0.04$ and 0.03). In addition, from both the treatment group and the comparison group across all three time points, Black/African American participants tend to score lower compared to white participants on all LSP items except for Attitude Toward Pregnancy. Some statistically significant positive effects from demographic variables were found with no clear pattern, though understandable (e.g., having stable housing is associated with higher

scores on the Attitude Toward Pregnancy).

The bootstrap procedure found that in the treatment group, all LSP-based parenting skill scores tended to increase from time 1 to time 3 except for Safety. In the treatment group, scores for the Attitude Toward Pregnancy tend to increase by 0.28 units on average with a 95% CI of (0.09, 0.48), scores for Nurture increased by 0.37 (0.13, 0.60), scores for Discipline increased by 0.34 (0.09, 0.59), and scores for Support increased by 0.49 (0.26, 0.71). The bootstrap results indicated that scores did not increase from time 1 to time 3 for any LSP item scores collected on the comparison group (see Table 5).

Table 5. Bootstrap estimates of mean difference in LSP parenting items

Variable	Group	Mean Change	SE	2.5 Pctile	97.5 Pctile
Attitude	Comparison	-0.05	0.14	-0.34	0.22
Attitude	Treatment	0.28	0.10	0.09	0.48
Nurture	Comparison	0.12	0.24	-0.33	0.58
Nurture	Treatment	0.37	0.12	0.13	0.60
Discipline	Comparison	-0.22	0.22	-0.65	0.23
Discipline	Treatment	0.34	0.13	0.09	0.59
Support	Comparison	0.16	0.23	-0.28	0.60
Support	Treatment	0.49	0.11	0.26	0.71
Safety	Comparison	0.10	0.21	-0.30	0.50
Safety	Treatment	0.14	0.11	-0.07	0.35

AAPI results

The scores from the TIES treatment group tend to rise over time while scores from the comparison group tend to remain flat or even decline. Figure 2 shows the mean scores of the five AAPI-2 variables by group across all three data-collection time points. We ran a t-test to compare scores from the treatment group with those from the comparison group for each of the five variables at each of the three time points (Table 7). For the Appropriate Expectations and Power and Independence subscales, the t-test didn't find a statistically significant difference in scores between the treatment group and the comparison group at any time point; however, by time 3, there is nearly a significant difference ($p = 0.07$ and 0.06 respectively), indicating that the TIES Program helps move scores in these domains in a positive direction.

Figure 2. Mean AAPI Scores by Group and Time

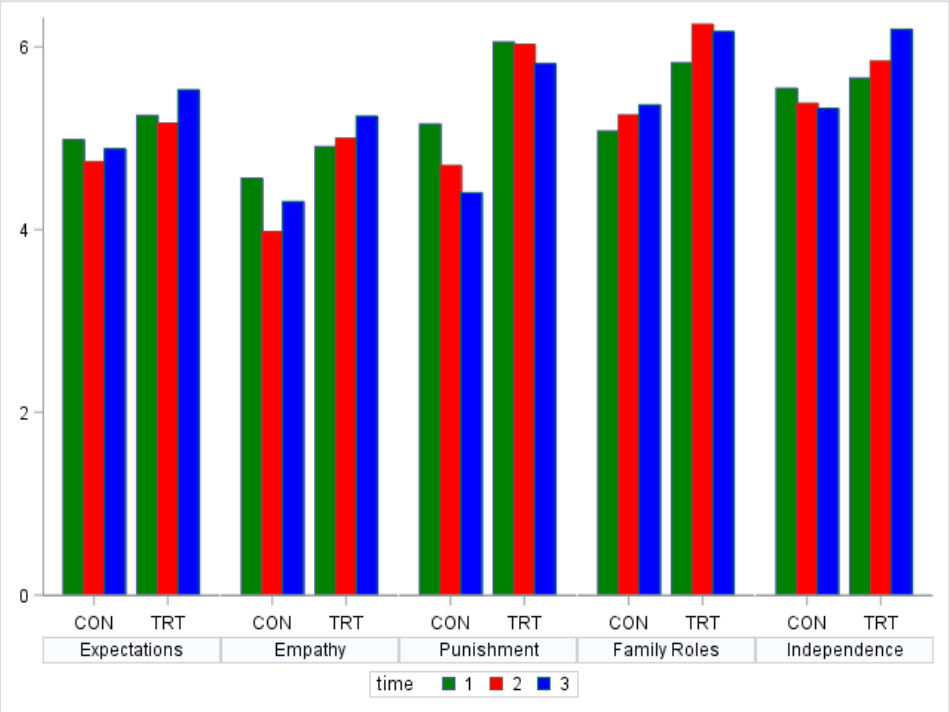


Table 6. MLM and GEE Output for LSP Dependent Variables

		MLM					GEE			
Dependent Variable	Parameter	Estimate	SE	DF	T	Probt	Estimate	SE	Z	ProbZ
Attitude Toward Pregnancy	Intercept	2.84	0.17	239	16.43	0.00	2.83	0.20	14.48	0.00
	Treatment	-0.52	0.15	214	-3.36	**0.00**	-0.50	0.18	-2.81	**0.00**
	Time	-0.05	0.05	214	-0.94	0.35	-0.04	0.04	-1.00	0.32
	Treatment *Time	0.16	0.06	214	2.56	**0.01**	0.15	0.06	2.71	**0.01**
	Covid Period*Treatment	0.04	0.10	214	0.41	0.69	0.03	0.09	0.38	0.71
	Covid Period*Comparison	-0.20	0.10	214	-1.96	0.05	-0.20	0.09	-2.17	**0.03**
	Stable Housing	0.50	0.11	214	4.37	**0.00**	0.49	0.12	4.21	**0.00**
Nurturing	Intercept	4.32	0.20	248	21.97	0.00	4.33	0.19	23.04	0.00
	Treatment	-0.86	0.22	267	-3.87	**0.00**	-0.87	0.21	-4.12	**0.00**
	Time	-0.09	0.08	267	-1.12	0.26	-0.09	0.09	-0.94	0.35
	Treatment *Time	0.25	0.10	267	2.63	**0.01**	0.26	0.10	2.48	**0.01**
	Covid Period*Treatment	-0.31	0.15	267	-2.06	**0.04**	-0.34	0.15	-2.21	**0.03**
	Covid Period*Comparison	-1.03	0.16	267	-6.37	**0.00**	-1.06	0.18	-5.85	**0.00**
	Race (Black)	-0.36	0.11	267	-3.23	**0.00**	-0.36	0.11	-3.35	**0.00**
	Race (Other)	-0.20	0.21	267	-0.95	0.34	-0.19	0.19	-1.00	0.32
Discipline	Intercept	4.76	0.18	206	26.16	0.00	4.72	0.16	29.69	0.00
	Treatment	-1.30	0.22	195	-5.99	**0.00**	-1.24	0.21	-5.91	**0.00**
	Time	-0.23	0.07	195	-3.18	**0.00**	-0.25	0.09	-2.83	**0.00**
	Treatment *Time	0.38	0.09	195	4.20	**0.00**	0.40	0.10	3.91	**0.00**
	Covid Period*Treatment	-0.10	0.16	195	-0.64	0.53	-0.13	0.14	-0.88	0.38
	Covid Period*Comparison	-0.65	0.14	195	-4.51	**0.00**	-0.63	0.15	-4.16	**0.00**
	Race (Black)	-0.48	0.12	195	-4.10	**0.00**	-0.47	0.12	-3.84	**0.00**
	Race (Other)	-0.29	0.23	195	-1.28	0.20	-0.64	0.19	-3.47	**0.00**
Support	Intercept	3.64	0.19	244	19.27	0.00	3.67	0.22	16.81	0.00
	Treatment	-0.97	0.20	266	-4.75	**0.00**	-1.00	0.22	-4.46	**0.00**
	Time	-0.06	0.07	266	-0.85	0.39	-0.06	0.08	-0.80	0.42

	Treatment *Time	0.30	0.09	266	3.49	**0.00**	0.30	0.09	3.31	**0.00**
	Covid Period*Treatment	0.00	0.14	266	0.01	0.99	0.01	0.13	0.11	0.92
	Covid Period*Comparison	-0.79	0.15	266	-5.33	**0.00**	-0.82	0.18	-4.42	**0.00**
	Race (Black)	-0.47	0.11	266	-4.36	**0.00**	-0.47	0.10	-4.51	**0.00**
	Race (Other)	-0.08	0.20	266	-0.40	0.69	-0.01	0.15	-0.08	0.94
	HS and above	0.27	0.10	266	2.67	**0.01**	0.28	0.10	2.77	**0.01**
Safety	Intercept	4.29	0.18	237	23.94	0.00	4.79	0.22	22.07	0.00
	Treatment	-0.40	0.19	261	-2.08	**0.04**	-0.99	0.23	-4.28	**0.00**
	Time	-0.10	0.07	261	-1.50	0.13	-0.18	0.09	-1.96	0.05
	Treatment *Time	0.16	0.08	261	2.00	0.05	0.23	0.10	2.28	**0.02**
	Covid Period*Treatment	0.11	0.13	261	0.78	0.43	0.16	0.11	1.39	0.17
	Covid Period*Comparison	-0.75	0.14	261	-5.52	**0.00**	-0.98	0.19	-5.27	**0.00**
	Race (Black)	-0.33	0.10	261	-3.41	**0.00**	-0.41	0.10	-4.11	**0.00**
	Race (Other)	-0.19	0.18	261	-1.06	0.29	0.98	0.15	6.36	**0.00**
	HS and above	0.19	0.09	261	2.09	**0.04**	0.37	0.10	3.70	**0.00**
	Employed	0.24	0.11	261	2.15	**0.03**				
	Kansas	-0.23	0.09	261	-2.42	**0.02**	-0.32	0.11	-2.95	**0.00**

Table 7. AAPI variable t-test p-values

	Time 1	Time 2	Time 3
Appropriate Expectations	0.37	0.13	0.07
Empathy	0.30	0.01	0.01
Corporal Punishment	0.00	0.00	0.00
Family Roles	0.03	0.01	0.04
Power and Independence	0.76	0.29	0.06

Research Question 2: Are there differences in parenting practices regarding well child health visits and immunizations between participants who receive the TIES Program intervention and participants who receive care as usual?

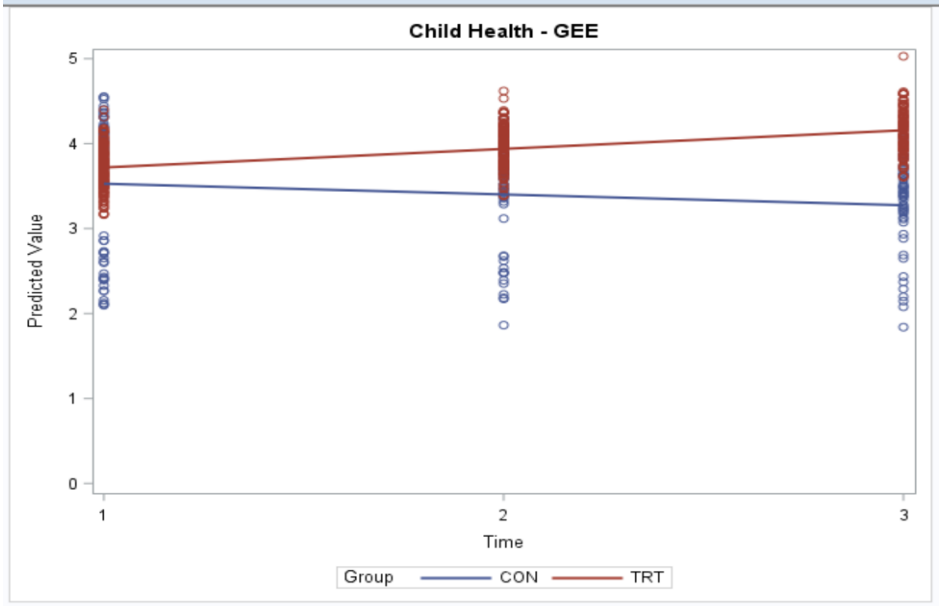
IFSP Child Health results

The Child Health Goal of the TIES IFSP Goal Attainment Scale, Health and Medical Care Scale of the Life Skills Progression, and parent survey regarding child health care visit/history and immunizations are the primary data sources for this research question. Table 8 displays the MLM and GEE model results. The MLM and GEE models showed that participants in the TIES treatment group tend to have child health scores 0.44 ($p<0.001$) and 0.39 ($p<0.001$) units higher compared to the comparison group, indicating that the TIES Program has a meaningful impact on child physical and behavioral health. Participants who are employed at enrollment tend to have a positive effect on child health goal. The older the mother is, the more likely the family will have a higher child health goal score. Participants who live in Kansas have a smaller attainment in child health compared to participants who live in Missouri. Figure 3 shows the predicted trend lines for child health scores at each timepoint for those in the TIES program versus those in the comparison group. There is an upward trend in child health scores for the TIES treatment, whereas a regressed trend for the comparison group.

Table 8. MLM and GEE Output for ISFP Child Health Score

	MLM					GEE			
Parameter	Estimate	SE	DF	tValue	Probt	Estimate	SE	Z	ProbZ
Intercept	3.24	0.33	218	9.76	0.00	3.17	0.35	9.03	0.00
Treatment	-0.46	0.20	250	-2.29	**0.02**	-0.37	0.19	-1.90	0.06
Time	-0.21	0.06	250	-3.36	**0.00**	-0.17	0.07	-2.47	**0.01**
Treatment *Time	0.44	0.08	250	5.45	**0.00**	0.39	0.09	4.49	**0.00**
Covid *Treatment	0.14	0.18	250	0.78	0.43	0.14	0.17	0.84	0.40
Covid *Comparison	-0.80	0.14	250	-5.65	**0.00**	-0.81	0.19	-4.35	**0.00**
Race (Black)	-0.22	0.11	250	-2.08	**0.04**	-0.22	0.11	-2.01	**0.04**
Race (Other)	-0.12	0.21	250	-0.59	0.55	-0.12	0.13	-0.94	0.35
Employed	0.28	0.12	250	2.36	**0.02**	0.28	0.12	2.43	**0.01**
Kansas	-0.22	0.11	250	-2.08	**0.04**	-0.22	0.10	-2.12	**0.03**
Maternal age	0.03	0.01	250	3.01	**0.00**	0.03	0.01	2.92	**0.00**

Figure 3. Predicted Values of IFSP Child Health Score from the GEE Model



The bootstrap procedure found that from time 1 to time 3, child health scores increased by 0.43 units on average for the treatment group with a 95% CI of (0.19, 0.66), while no significant change in child health score was found for the comparison group (see Table 9).

Table 9. Bootstrap estimates of mean difference in IFSP child health score

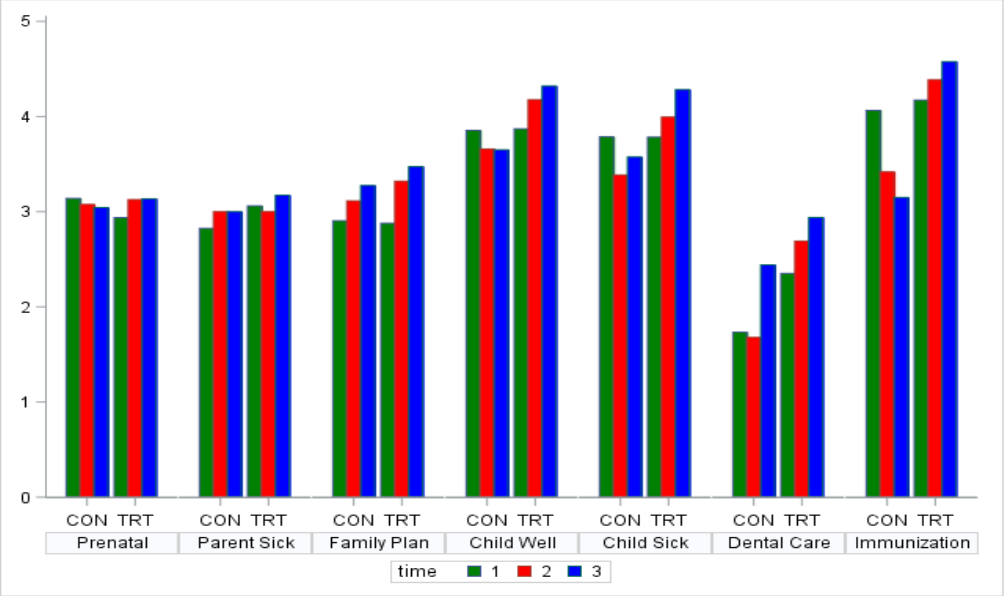
Group	Mean Change	SE	2.5 Pctile	97.5 Pctile
Treatment	0.43	0.12	0.19	0.66
Comparison	-0.21	0.20	-0.62	0.19

LSP item results

Output from MLM and GEE models used to estimate the impact of the TIES Program on seven LSP items around child health is displayed in Table 10. The MLM and GEE models found that four of the seven LSP items trend higher over time for those in the TIES Program compared to the comparison group: Prenatal Care showed 0.27 (p=0.02) and 0.28 (p=0.03) units higher in the MLM and GEE models respectively; Child Well Care trends 0.42 (p=0.00) and 0.42 (p=0.00) units higher; Child Sick Care trends 0.43 (p=0.00) and 0.45 (p=0.00) units higher; and Immunization trends 0.78 (p=0.00) and 0.80 (p=0.00) units higher. These results indicated that the TIES Program has a significant positive impact on child health items.

Figure 4 shows the mean score of seven LSP items related to child health. From the results, mean scores for the treatment group tend to be higher than those from the comparison group across time points and tend to rise over time whereas scores from the comparison group tend to remain flat or even decrease over time.

Figure 4. Mean LSP Scores by Group and Timepoint



In addition, the covid period had a negative and statistically significant impact on all LSP child health scores except for Dental Care, which had the smallest sample of available data of all variables analyzed here. The magnitude of the negative impact of the covid period on child health scores ranged from -0.36 to -1.11 depending on the LSP item and the type of model used in estimation. No statistically significant impact of the covid period was found on LSP-based child health scores from the treatment group, with one exception: the GEE model for Prenatal care estimated that the covid period had a positive impact of 0.29 units (p=0.04).

We also found that race impacts child health scores, with Black/African Americans estimated to have lower scores in five of the seven LSP-based child health items across both the treatment and control groups and across all three timepoints. These five items are Prenatal Care, Child Well Care, Child Sick Care, Dental Care, and Immunizations, with the negative impact on scores ranging from -0.27 to -0.56 depending on the item and type of model used for estimation.

The bootstrap procedure found that between time 1 and time 3, mean scores increased in five of the seven variables collected from the treatment group. Table 11 shows the output from the bootstrap procedure on the seven LSP-based child health variables. In the treatment group, scores increased by 0.59 units on average in Family Planning with a 95% CI of (0.25, 0.93); by 0.45 units in Child Well Care (0.20, 0.69); by 0.50 for Child Sick Care (0.25, 0.74); by 0.59 in Child Dental Care (0.10, 1.06); and by 0.40 for Immunization (0.18, 0.63). For the comparison group, the only statistically significant result from the bootstrap procedure was that mean scores for Immunization are estimated to decline by 0.92 units between time 1 and time 3 with a 95% CI of (-1.45, -0.36).

Table 10. MLM and GEE Output for LSP Child Health Scores

		MLM					GEE			
Dependent Variable	Parameter	Estimate	StdErr	DF	tValue	Probt	Estimate	StdErr	Z	ProbZ
Prenatal	Intercept	3.14	0.31	220	10.15	0.00	3.16	0.32	9.82	0.00
	Treatment Group	-0.75	0.27	169	-2.75	0.01	-0.77	0.28	-2.79	0.01
	Time Trend	-0.19	0.10	169	-1.89	0.06	-0.20	0.12	-1.73	0.08
	Treatment Group*Time	0.27	0.12	169	2.30	0.02	0.28	0.13	2.12	0.03
	Covid Period*Treatment	0.26	0.18	169	1.50	0.14	0.29	0.14	2.02	0.04
	Covid Period*Comparison	-0.68	0.20	169	-3.50	0.00	-0.73	0.18	-4.07	0.00
	Race (Black)	-0.41	0.15	169	-2.76	0.01	-0.41	0.14	-2.93	0.00
	Race (Other)	-0.06	0.28	169	-0.23	0.82	-0.06	0.27	-0.21	0.84
	Stable Housing	0.63	0.18	169	3.53	0.00	0.64	0.18	3.57	0.00
	Pregnant at Intake	0.32	0.14	169	2.31	0.02	0.32	0.13	2.54	0.01
Parent Sick	Intercept	2.30	0.26	260	8.98	0.00	2.39	0.23	10.22	0.00
	Treatment Group	0.20	0.24	279	0.84	0.40	0.14	0.22	0.62	0.54
	Time Trend	0.07	0.09	279	0.80	0.43	0.07	0.08	0.79	0.43
	Treatment Group*Time	0.01	0.10	279	0.11	0.91	0.01	0.10	0.11	0.91
	Covid Period*Treatment	-0.18	0.16	279	-1.10	0.27	-0.16	0.15	-1.10	0.27
	Covid Period*Comparison	-0.36	0.18	279	-2.06	0.04	-0.38	0.16	-2.38	0.02
	HS and above	0.23	0.12	279	1.97	0.05	0.26	0.12	2.21	0.03
	Employed	0.27	0.14	279	1.87	0.06				
	Stable Housing	0.35	0.15	279	2.36	0.02	0.36	0.16	2.32	0.02
Family Plan	Intercept	1.01	0.55	251	1.86	0.06	1.11	0.57	1.94	0.05
	Treatment Group	-0.17	0.33	278	-0.53	0.60	-0.30	0.32	-0.94	0.35
	Time Trend	0.10	0.12	278	0.84	0.40	0.06	0.13	0.47	0.64
	Treatment Group*Time	0.19	0.14	278	1.40	0.16	0.23	0.15	1.53	0.13
	Covid Period*Treatment	-0.04	0.22	278	-0.19	0.85	0.06	0.27	0.21	0.84
	Covid Period*Comparison	-0.75	0.24	278	-3.20	0.00	-0.81	0.21	-3.91	0.00
	Hispanic	-0.54	0.27	278	-2.04	0.04	-0.54	0.24	-2.25	0.02

	Stable Housing	0.81	0.21	278	3.93	0.00	0.82	0.21	3.89	0.00
	Kansas	-0.45	0.16	278	-2.76	0.01	-0.46	0.16	-2.84	0.00
	Mom Age at Intake	0.05	0.02	278	3.31	0.00	0.05	0.02	3.12	0.00
Child Well Care	Intercept	3.60	0.41	242	8.79	0.00	3.61	0.47	7.62	0.00
	Treatment Group	-0.60	0.24	253	-2.44	0.02	-0.60	0.25	-2.38	0.02
	Time Trend	-0.23	0.09	253	-2.67	0.01	-0.23	0.10	-2.26	0.02
	Treatment Group*Time	0.42	0.11	253	3.97	0.00	0.42	0.12	3.56	0.00
	Covid Period*Treatment	0.07	0.17	253	0.44	0.66	0.10	0.14	0.67	0.50
	Covid Period*Comparison	-0.88	0.17	253	-5.03	0.00	-0.84	0.25	-3.37	0.00
	Race (Black)	-0.41	0.12	253	-3.41	0.00	-0.41	0.12	-3.32	0.00
	Race (Other)	0.07	0.22	253	0.32	0.75	0.08	0.16	0.47	0.64
	Stable Housing	0.40	0.15	253	2.68	0.01	0.41	0.18	2.21	0.03
	Kansas	-0.40	0.12	253	-3.51	0.00	-0.40	0.12	-3.42	0.00
	Mom Age at Intake	0.03	0.01	253	2.36	0.02	0.03	0.01	2.28	0.02
Child Sick Care	Intercept	3.48	0.33	234	10.52	0.00	3.64	0.36	10.15	0.00
	Treatment Group	-0.60	0.22	240	-2.80	0.01	-0.74	0.21	-3.49	0.00
	Time Trend	-0.22	0.08	240	-2.93	0.00	-0.26	0.08	-3.11	0.00
	Treatment Group*Time	0.43	0.09	240	4.64	0.00	0.45	0.10	4.67	0.00
	Covid Period*Treatment	0.17	0.15	240	1.15	0.25	0.17	0.16	1.08	0.28
	Covid Period*Comparison	-0.76	0.15	240	-5.01	0.00	-0.83	0.17	-4.85	0.00
	Race (Black)	-0.43	0.10	240	-4.13	0.00	-0.45	0.11	-4.20	0.00
	Race (Other)	0.09	0.20	240	0.46	0.65	0.14	0.15	0.95	0.34
	HS and above	0.27	0.10	240	2.75	0.01	0.30	0.10	3.03	0.00
	Employed	0.24	0.12	240	1.96	0.05				
	Kansas	-0.31	0.10	240	-3.09	0.00	-0.32	0.10	-3.19	0.00
	Mom Age at Intake	0.03	0.01	240	2.90	0.00	0.03	0.01	3.07	0.00
Child Dental Care	Intercept	2.01	0.48	143	4.22	0.00	1.85	0.39	4.78	0.00
	Treatment Group	0.14	0.53	93	0.26	0.79	0.36	0.45	0.79	0.43
	Time Trend	0.19	0.18	93	1.04	0.30	0.24	0.18	1.34	0.18
	Treatment Group*Time	0.12	0.21	93	0.57	0.57	0.05	0.21	0.22	0.83

	Race (Black)	-0.55	0.22	93	-2.45	0.02	-0.56	0.21	-2.71	0.01
	Race (Other)	0.04	0.39	93	0.10	0.92	-0.03	0.34	-0.07	0.94
Immunizations	Intercept	4.84	0.25	240	19.44	0.00	5.40	0.21	25.50	0.00
	Treatment Group	-0.95	0.24	247	-4.04	0.00	-1.28	0.24	-5.35	0.00
	Time Trend	-0.63	0.09	247	-7.31	0.00	-0.63	0.12	-5.46	0.00
	Treatment Group*Time	0.78	0.10	247	7.57	0.00	0.80	0.13	6.33	0.00
	Covid Period*Treatment	-0.03	0.16	247	-0.16	0.88	0.00	0.14	-0.03	0.98
	Covid Period*Comparison	-1.00	0.17	247	-5.87	0.00	-1.11	0.24	-4.63	0.00
	Race (Black)	-0.27	0.11	247	-2.49	0.01	-0.31	0.11	-2.80	0.01
	Race (Other)	0.00	0.21	247	0.02	0.98	0.54	0.15	3.69	0.00
	Employed	0.31	0.13	247	2.43	0.02				
	Stable Housing	0.28	0.14	247	1.99	0.05				

Table 11. Bootstrap Estimates of Difference in Means in LSP Child Health Scores

Variable	Group	Mean Change	SE	2.5 Pctile	97.5 Pctile
Prenatal Care	Comparison	-0.10	0.31	-0.69	0.51
	Treatment	0.20	0.17	-0.14	0.52
Parent Sick	Comparison	0.17	0.22	-0.26	0.62
	Treatment	0.11	0.14	-0.15	0.38
Family Plan	Comparison	0.37	0.32	-0.26	0.98
	Treatment	0.59	0.17	0.25	0.93
Child Well Care	Comparison	-0.21	0.26	-0.71	0.31
	Treatment	0.45	0.13	0.20	0.69
Child Sick Care	Comparison	-0.21	0.22	-0.64	0.22
	Treatment	0.50	0.12	0.25	0.74
Dental	Comparison	0.70	0.34	0.00	1.36
	Treatment	0.59	0.25	0.10	1.06
Immunization	Comparison	-0.92	0.28	-1.45	-0.36
	Treatment	0.40	0.11	0.18	0.63

Table 12 shows the number of well child visits by treatment group and age of the child. Children in the treatment group tend to receive well child visits more frequently and later into childhood than children in the comparison group.

Table 12. Number of Well Child Visits by Group Through 09-29-2023

	Comparison		Treatment	
	N	Pct of Participants (70)	N	Pct of Participants (272)
Newborn	56	80%	139	51%
1-2 months	32	46%	171	63%
3-4 months	28	40%	109	40%
5-6 months	21	30%	98	36%
7-9 Months	0	0%	92	34%
10-12 Months	12	17%	98	36%
13-15 months	3	4%	62	23%
16-18 months	0	0%	45	17%
19-24 months	0	0%	58	21%

Research Question 3: Are there differences in linkages and referrals to community services between participants who receive the TIES Program intervention and participants who receive care-as-usual?

The Life Skills Progression and service referral data are the primary data sources used to address this research question. Table 14 displays MLM and GEE model output. The treatment group showed higher scores compared to the comparison group by 0.22 to 0.33 units depending on the dependent variable and type of model used. Figure 5 shows the mean score of three LSP-based items related to relationships with caseworkers. Mean scores for the treatment group tend to increase throughout the TIES program while scores from the comparison group tend to be flat. The covid period had a negative and statistically significant impact on scores from the comparison group, with the magnitude of the impact ranging from -0.53 to -0.94 depending on the item and type of model used for estimation. Race also showed a negative and statistically significant impact on Relationship scores. Black/African Americans tend to have lower LSP relationship scores for both the TIES treatment group and the comparison group across all three time points. The magnitude of this impact ranged from -0.26 to -0.43 depending on the item and type of model used in estimation.

For the treatment group, from time 1 to time 3, scores for Relationship were estimated to increase by 0.39 units on average with a 95% CI of (0.15, 0.63); scores were estimated to increase by 0.41 units for Use of Information (0.18, 0.63); and scores were estimated to increase by 0.37 units for Use of Resources (0.13, 0.61). For the comparison group, the bootstrap procedure did not indicate that scores change between time 1 and time 3 for any of the three LSP relationship items (Table 13).

Table 13. Bootstrap Estimates of Mean Difference for LSP Linkages and Referrals

Variable	Group	Mean Change	SE	2.5 Pctile	97.5 Pctile
Relationship	Comparison	-0.21	0.32	-0.86	0.40
	Treatment	0.39	0.12	0.15	0.63
Information	Comparison	0.05	0.21	-0.36	0.46
	Treatment	0.41	0.11	0.18	0.63
Resources	Comparison	0.00	0.23	-0.46	0.46
	Treatment	0.37	0.12	0.13	0.61

Table 15 displays the categories of services to which referrals were made. The TIES Program maintains records of whether the participant accesses the referred service provider and whether that service is provided. Differences exist in the linkage and referrals to community services between participants who received the TIES Program intervention and participants who received care-as-usual. Families who received the TIES Program demonstrated a positive trajectory of progress in relationships with workers and use of resources/information, whereas families in the care-as-usual group showed a tendency to decline in these areas. In addition, participants' characteristics played a role in growth in these areas, as some participants grew faster and more than other participants. The findings explained why and how TIES participants do better in parenting and child health. TIES participants access wrap-around services through TIES staff, who bring in connections to community services.

Table 14. MLM and GEE Output for LSP Variables Related to Linkages and Referrals

		MLM					GEE			
Dependent Variable	Parameter	Estimate	StdErr	DF	tValue	Probt	Estimate	StdErr	Z	ProbZ
Relationship	Intercept	4.23	0.25	247	17.24	0.00	4.22	0.27	15.83	0.00
	Treatment	-0.63	0.26	250	-2.46	**0.01**	-0.63	0.28	-2.24	**0.03**
	Time	-0.13	0.10	250	-1.29	0.20	-0.13	0.13	-1.03	0.31
	Treatment *Time	0.33	0.11	250	2.91	**0.00**	0.33	0.14	2.40	**0.02**
	Covid Period*Treatment	-0.12	0.14	250	-0.87	0.38	-0.13	0.15	-0.90	0.37
	Covid Period*Comparison	-0.94	0.27	250	-3.44	**0.00**	-0.94	0.35	-2.70	**0.01**
	Race (Black)	-0.43	0.12	250	-3.68	**0.00**	-0.43	0.12	-3.76	**0.00**
	Race (Other)	0.03	0.25	250	0.11	0.91	0.02	0.29	0.06	0.95
	Hispanic	-0.49	0.20	250	-2.39	**0.02**	-0.49	0.22	-2.25	**0.02**
	Employed	0.33	0.14	250	2.37	**0.02**	0.33	0.13	2.52	**0.01**
	Kansas	-0.24	0.11	250	-2.19	**0.03**	-0.24	0.11	-2.18	**0.03**
Use of Information	Intercept	3.89	0.20	262	19.87	0.00	3.87	0.23	16.76	0.00
	Treatment	-0.56	0.21	288	-2.67	**0.01**	-0.53	0.24	-2.15	**0.03**
	Time	-0.04	0.08	288	-0.56	0.58	-0.03	0.10	-0.26	0.79
	Treatment *Time	0.24	0.09	288	2.64	**0.01**	0.22	0.11	1.95	0.05
	Covid Period*Treatment	-0.07	0.14	288	-0.50	0.61	-0.11	0.12	-0.90	0.37
	Covid Period*Comparison	-0.72	0.16	288	-4.47	**0.00**	-0.71	0.21	-3.36	**0.00**
	Race (Black)	-0.31	0.10	288	-3.04	**0.00**	-0.31	0.10	-3.10	**0.00**
	Race (Other)	-0.35	0.20	288	-1.76	0.08	-0.39	0.21	-1.84	0.07
	Employed	0.29	0.12	288	2.38	**0.02**	0.29	0.12	2.54	**0.01**
Use of Resources	Intercept	2.58	0.36	261	7.21	0.00	2.58	0.36	7.23	0.00
	Treatment	-0.32	0.22	289	-1.43	0.15	-0.30	0.22	-1.35	0.18
	Time	-0.08	0.08	289	-1.02	0.31	-0.05	0.08	-0.67	0.50
	Treatment *Time	0.26	0.09	289	2.77	**0.01**	0.23	0.09	2.47	**0.01**
	Covid Period*Treatment	-0.03	0.15	289	-0.21	0.83	-0.01	0.14	-0.10	0.92
	Covid Period*Comparison	-0.53	0.16	289	-3.23	**0.00**	-0.63	0.21	-3.00	**0.00**

	Race (Black)	-0.26	0.11	289	-2.29	**0.02**	-0.26	0.11	-2.30	**0.02**
	Race (Other)	-0.35	0.21	289	-1.64	0.10	-0.32	0.20	-1.59	0.11
	Employed	0.46	0.13	289	3.51	**0.00**	0.45	0.12	3.66	**0.00**
	Maternal age	0.03	0.01	289	3.18	**0.00**	0.03	0.01	3.22	**0.00**

Figure 5. Mean LSP Scores by Group and Time

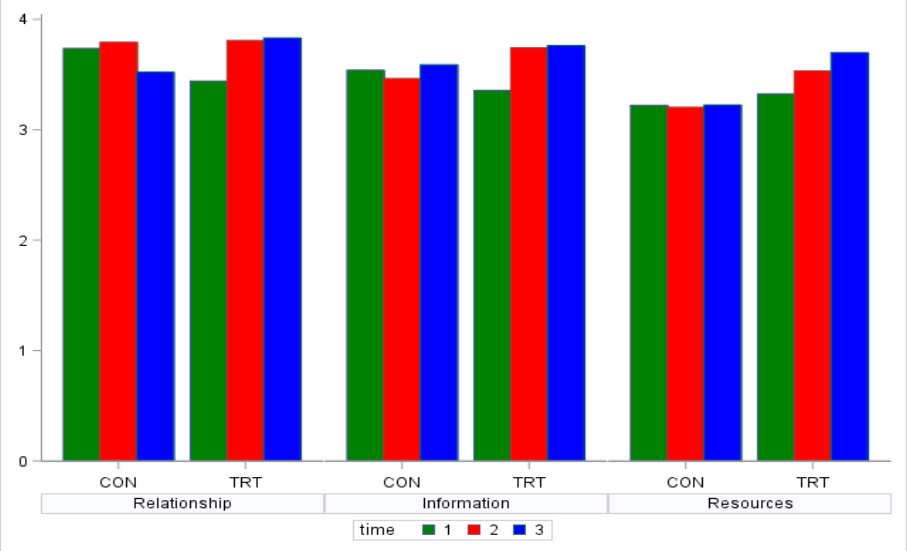


Table 15. Referrals Made by Group

Referral Activity Through 9-29-23	Treatment Group	Comparison Group
Child Development/Daycare/School	150	-
Mental Health Care	116	32
Emergency Assistance	104	13
Other	81	9
Physical Health Care	61	25
AOD Treatment	56	23
Transitional Living/Shelter	53	-
Permanent Housing	30	34
Employment Assistance	17	-
IPV Services	15	2
Public Assistance	10	97
Nutritional Services	8	-
Child Welfare/Juvenile Justice	6	-
Parent Education or Vocation Services	6	9
Social Security	3	-
Tobacco Cessation Services	3	-

Discussion

Interpretation of findings

The final comprehensive analysis using the TIES goal attainment scale and life skills progression, both of which are validated, indicated that the TIES Program is effective. There were differences in parenting practices regarding interaction with the child, child health outcomes, and linkage to community services between participants who received the TIES Program intervention and participants who received care as usual. Participants who received the TIES Program intervention showed a statistically significant improvement over time and were able to maintain their skills in parenting, whereas participants who received care as usual showed a little improvement and even a trend in regressing in parenting skills as their children grew older. Likewise, families who received the TIES Program showed significant progress in child health goal, whereas families in the care-as-usual group showed a tendency to decline in the same goal. In addition, families who received the TIES Program demonstrated progress in relationships with workers and use of resources/information, whereas families in the care-as-usual group showed a tendency to decline in these areas.

There was also a high degree of consistency of results from various statistical techniques employed to answer each research question; We did not encounter any contradictory results. In addition, the Covid-19 pandemic impacted the comparison group, often resulting in lower scores on outcome measures during the Covid period (April 1, 2020 – March 31, 2021). However, there was little impact from the pandemic on outcome scores from those in the TIES program. The final analysis results are consistent with prior findings. The analysis results indicated participants with certain characteristics tend to have more attainment in goals, providing information on how the TIES Program could be refined and tailored to address the disparity caused by demographics. The FY23 and FY24 evaluations will dive deep into how the TIES Program meet the needs of participants from various backgrounds using the Precision Home Visiting Paradigm.

Study limitations

One of the limitations of the study is the sample size of the comparison group. Recruitment and retention for the comparison group have been challenging, especially during the COVID-19 pandemic. The statistical models used in the analysis were rigorous enough to deal with the unbalanced sample size between the treatment group and the comparison group. In line with the data analysis, the end of the covid period was determined internally, while the effect of covid continues to impact the lives of families and program implementation.

Another limitation of the study is the differences in data collection methods. Specifically, the comparison group data was scored through phone interviews with probing questions and might be skewed because it solely relied on the mother's self-report, whereas the treatment group data was scored by program staff in-home visits with in-person interactions and observation. The COVID-19 pandemic has also created barriers to recruitment, retention, data collection, and the conduct of timely assessments for both the treatment group and the comparison group. We are seeing relatively more incomplete data, especially from the treatment group in the reporting period due to the pandemic and staff turnover.

Implications and recommendations for practice

The positive findings indicated that the TIES Program has an impact on very challenged families and should continue its efforts, as well as seeking quality improvements. The generalizability of the study to the larger population is promising. More reliable inferences in the generalizability of this study can be made through the completion of the Effectiveness Study. Given the various high-risk factors associated with this population, the TIES Program model could be applied to similar populations in other contexts.

The primary recommendation is to continue to provide TIES model services to families in need with fidelity and to continue to refine the TIES Program intervention. Peer-reviewed journal publications would benefit the program and support similar programs in the field. In the next reporting period, one potential paper would be the impact of relationships on program engagement and retention. The evaluation team will continue to work closely with the TIES Manager for more research paper opportunities and publication venues.

Use and dissemination

Results from the study are shared with the TIES Manager and Specialists quarterly. External stakeholders in the TIES Advisory Council are updated quarterly as well, sharing various portions of the implementation and matched comparison group studies quarterly. The TIES Manager serves on the regional Opioid Task Force to address issues related to improved services to our local population and contributes information to surveys and other tools as well as advocating for lessons learned from TIES with other area providers. The TIES Program also has representation on the Kansas City Perinatal Recovery Collaborative and can provide implementation materials and other counsel regarding service collaboration. The evaluators also share results with the MIECHV evaluation group locally and regionally and present practices, findings, and lessons learned at national conferences. An article about the impact of worker-participant relationships on goal attainment was published in the Health & Social Care in the Community Journal in December 2023. A poster was presented in person at the at Children's Mercy Research Summit in 2023. Table 16 summarizes the primary dissemination in the period.

Table 16. Dissemination Activities

Local Dissemination	2021	2022	2023
TIES Advisory Council – Quarterly Briefs on Progress and Findings	X	X	X
TIES Annual Reports	X	X	X
Poster Presentation – The Impact of Relationship on Program Outcomes – Children's Mercy Hospital Research Summit			X
National Dissemination	**2021**	**2022**	**2023**
Peer Reviewed Journal Article – A Promising Approach in Home Visiting to Support Families Affected by Maternal Substance Use - Maternal and Child Health Journal	X		
Poster Presentation – A New, Validated Assessment Tool Demonstrates Positive Outcomes in Home Visiting Model for Families Affected by Maternal Substance Use – The Administration for Children and Families' National Research Conference on Early Childhood - virtual	X		

Peer Reviewed Journal Article – Development and Validation of a Goal Attainment Scale for Families Affected by Maternal Substance Use – Infant Mental Health Journal	X	X	
Paper Presentation- The Impact of Staff-Participant Relationship to Goal Attainment in a Home-based Family Support Program—CityMatch Conference – Chicago, IL.		X	
Peer Reviewed Journal Article Submission– The Impact of Staff-Participant Relationship to Goal Attainment in a Home-based Family Support Program – The Maternal and Child Health Journal		X	
Peer Review Journal Article – The Impact of Relationship on Goal Attainment in a Home-Based Family Support Program – Health & Social Care in the Community Journal			X

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