Supporting Pregnant Individuals in the Medicaid Population with a Community Based Intervention-A Feasible Study

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Abstract

Background: Those who are enrolled in Medicaid and from minoritized groups are more susceptible to adverse maternal outcomes and lack of support. A peer-based community support program may be an effective way of helping these individuals through pregnancy through providing community, resources and tailored education.

Objective: To determine feasibility of adapting a peer support program-Connect for Life (CFL) to the maternal health population in which local facilitators with shared lived experience run peer support groups with both nulliparous and multiparous mothers, provide support and community to each other.

Methods: Through a feasibility study design, 1,482 expectant mothers were identified from claims data in greater Detroit, Michigan and grouped by geography and expected due date. Attendees were invited to the maternal CFL program which focused on education, practical exercises, access, navigation, social support and addressing social determinants needs. Routine operational metrics for engagement and running costs were collected and compared to engagement in the standard CFL program (N=16,911) that was provided to members enrolled in Medicaid in Detroit over the same time period. A subsample of expectant mothers completed a five point Likert survey that captured member sentiment of the maternal CFL program.

Results: Of the 1,482 expectant mothers identified, 477 members were successfully contacted and 47 attended the maternal CFL program. This was higher than usual CFL attendance rates for the Medicaid population in the standard CFL program (3.17% *vs.* 1.58% (p=<0.01, 95% CI for difference (0.1%-2.5%)). Costs of running the program were significantly higher than the standard CFL program. 95% of surveyed members agreed or strongly agreed that the program improved knowledge and was valuable in the maternal CFL program.

Discussion: The maternal CFL program appears to be a feasible peer support program for expectant mothers enrolled in Medicaid with member sentiment being high. The program has higher running costs than the standard CFL program, but its higher rate of attendance indicates sufficient demand amongst this Medicaid population. This feasibility study provides a foundation for further studies examining scalability, quality and cost effectiveness.

Keywords: Pregnancy; Health; Population; Community

Introduction

Patients who are insured by Medicaid represent $671.2 billion US dollars ($USD) of healthcare spend per year, approximately 16% of overall healthcare expenditures [1]. Historically underserved racial and ethnic groups account for 37% of the US population and 47% of Medicaid enrollees and have worse outcomes and the highest variation in outcomes, access and cost when compared to their peers [2-4].

Primary and secondary prevention initiatives have been well established as an effective strategy for managing health in the most value driven manner [5]. Many of these initiatives require

the health system to interact with individuals in the community to intervene in a timely fashion. Scalable community interventions have been shown to be effective [6]. The existing "standard" Connect for Life (CFL) program is an example of one such initiative. Community Engagement Specialists (CES) in the CFL program form and manage peer groups in local neighborhoods to create trusted peer to peer social connections, demonstrate the importance of preventative care, address Social Determinants of Health (SDoH), barriers to obtaining care and improve care navigation and health behaviors through group based dynamics [7,8].

The peer to peer engagement forum leverages the psychology of influence by allowing individuals to socially connect in comfortable ways with their peers and connect with credible information sources, while becoming more astute consumers of health services in their community. CES are individuals hired from the local community well versed in local populations and their challenges and trained in motivational interviewing. Their profile and attributes are similar to those of Community Health Workers (CHW) and overlap with the 3C national curriculum for CHWs, a standardized national curriculum used in the training of CHW's [9]. This enables a foundation of trust to be built to effectively influence behavior change. Capitalizing on group based dynamics, members are encouraged to talk to one another about how they are feeling, address loneliness and isolation, how they have overcome barriers and challenges and share lessons and resources they have found helpful through facilitated peer support. CES follow up with members to ensure appointments are scheduled and attended and work closely with the health plan to close the loop on any referrals and appointments using the plans existing case management processes. The CFL program has been in use for 9 years, is deployed across 13 states and has demonstrated impacted in Medicaid populations [10].

Maternal health varies widely particularly in Medicaid, with those from minoritized groups experiencing worse outcomes [11,12]. There are well established programs offering peer-based support to tackle low birth weight, preterm birth and other adverse outcomes over the course of pregnancy [13]. While peer support has been shown to help in other health conditions including maternal health [14,15] and other studies have successfully demonstrated the effectiveness of peer support to address depression, stress and breastfeeding [16,17], at present there is a paucity of evidence in the literature of the feasibility of a mixed approach that combines peer support groups with a facilitator CES who is locally hired with deep understanding of local issues, resources, culture and shared lived experience to their prospective members, in the running of these groups for expectant mothers in Medicaid populations in the United States. Groups are typically run by the members themselves or by more skilled professionals such as midwifes or nurses in the existing literature referred to above. In addition, no study has compared a variant of the CFL program to its standard offering.

This objective of this study was to determine the feasibility of adapting the standard CFL peer support program when applied to a group of mothers enrolled in Medicaid through assessing:

- Whether member engagement rates in this cohort with a tailored maternal CFL program were equivalent to engagement rates in Medicaid for the standard CFL program offered to non-pregnant individuals.

- Whether costs to run this maternal CFL program in this cohort were similar to costs to deliver the standard CFL program offered to non-pregnant individuals enrolled in Medicaid.

- Whether members enrolled in the maternal CFL program found it acceptable through leveraging routinely collected surveys from members.

Materials and Methods

Using longitudinal claims data from a partner plan, Wider Circle (WC), a Community Based Organization (CBO) that delivers the CFL program, was able to identify mothers who were currently pregnant in Detroit, Michigan. Detroit was chosen to capitalize on existing service delivery infrastructure where the standard CFL program had been deployed for several years.

Inclusion criteria were all pregnant mothers aged 18-45 enrolled in the same managed Medicaid program enrolled at any time during September 2022 to February 2024. No limitations were put on whether the mother was experiencing their first or subsequent pregnancies. No other exclusion criteria were applied to the feasibility cohort. Engagement rates and costs were assessed over the same time period. The control group were female members who were eligible for the standard CFL program in the same health plan and geography aged 18-45 who were not pregnant over the study period.

The WC call center followed a protocol with a preapproved script explaining the program and inviting members to attend an in person kick-off event held at a local community center. Outreach was attempted on three separate occasions before removing members from the call list. The WC team grouped mothers into groups based on their location and expected due date, with the hypothesis being that doing so would create a shared lived experience that they were experiencing at a similar stage to each other, which would facilitate the members bond and trust in each other.

The maternal CFL program for this cohort differed to the standard CFL program in that it included a patient curriculum covering healthy eating, exercise, smoking and alcohol use during pregnancy, changes in emotions during pregnancy and how to cope with them, breast feeding, enrolling in key maternal health resources, ensuring expectant mothers had a birth plan in place and ensuring they had a registered obstetrician and were attending key appointments. No more than 30 minutes was spent on the patient curriculum with the rest of the time being used to facilitate building relationships and trust between members. Meetings typically lasted 1.5-3 hours and occurred in recreation centers, gyms or other community based locations led by a CES. In addition, members received support from the team in closing SDoH gaps around food, housing, transport (to events and appointments) and employment. The content was delivered through a mixture of in person and virtual events every two to four weeks lasting a total of 6 months.

In contrast the standard CFL exposure involved multiple small groups of enrollees participating in weekly, in-person or virtual, hour-long meetings led by a CES. Members were invited to participate in health promotion meetings, group physical activities and peer-to-peer local information exchanges about disease-specific wellness resources. Content includes understanding health plan benefits, addressing housing needs, changing diet, tackling food insecurity, improving physical activity, practicing gratitude and comprehending the importance of screening.

The main differences between the standard CFL program and the maternal CFL program are described in **Table 1** below. Further information on the standard CFL program is described in detail in existing published research [10]. Feasibility was understood through looking at three recognized domains in Bowen et al., framework [18,19], demand, practicality and acceptability. This framework was chosen based on its use in evaluating similar sized and types of public health interventions.

Objective 1

Demand was assessed through a key operational conversion metric. Number of members with successful group attendance in the maternal CFL program (defined as attending two or more in person or virtual events) as compared to group attendance of members enrolled in Medicaid receiving the standard CFL program. Call response rate was also collected, not as an indicator of demand but to observe its relation to conversion to attendance across the two cohorts. Two or more events being the threshold for attendance was based on contractual terms used to deliver the program. Pearson's chi-squared test for equality of proportions with continuous correction was used to assess difference in percentages. The comparison population were non pregnant eligible members enrolled in Medicaid, from the same health plan and geography, who were eligible for the standard CFL program.

Objective 2

Practicality was assessed through a cost accounting exercise, comparing WC member acquisition and operating costs to the standard CFL program population in Medicaid. Operating costs were obtained from internal operational metrics. Costs were divided into labor costs, defined as the unit costs for the staff to operationalize the program, event costs, defined as the sum of event rental, decorations, food and supplies costs, defined as event supplies and distributed item costs provided to members. Costs were normalized to units with one unit being equivalent to the smallest line item value and all other costs displayed relative to this unit. Costs were then converted to a rate per engagement and displayed as relative units to that rate. This was done to protect confidential financial information. No financial incentives were offered to either group. The comparison population were non pregnant members enrolled in Medicaid who WC served, from the same health plan and geography, who had enrolled in the standard CFL program.

Objective 3

Acceptability was assessed through leveraging a member questionnaire given to mothers after attending events in the program as part of routine quality and process improvement. This survey specifically looked at maternal health so was not delivered to attendees in the standard CFL program. Informed consent to participate was verbally obtained and witnessed by our staff at time of collection.

The questionnaire used a five point Likert scale and assessed thematic areas of importance including overall support, provision of resources, access, understanding of diet, exercise, emotions, breastfeeding, unhealthy habits to stop and what to expect from labor. The survey used is detailed in **Table 2**. All survey data were self-reported, administered via pen and paper and captured a single time after the program finished. Surveys were anonymous with no patient identifiable information.

The study was determined to be exempt from human subject research approval by Advarra due to the only human subject data collected and analyzed coming from anonymized survey results.

Table 1: Comparison of key differences between standard CFL program and maternal CFL program.

Aspect	Maternal CFL program	Standard CFL program
Frequency of events	Monthly	Quarterly
Duration of events	90-120 minutes	30-60 minutes
Duration of intervention	6 months	Until member disenrolls from plan
Profile of CES	Standard profile as described	Standard profile as described
Type of content	Maternal health focused	General health focused
Cohorting and grouping of members	Due date and trimester	Geography and social factors

Table 2: Five point Likert scale survey used to assess members knowledge of identified key themes to highlight during pregnancy.

Question	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
I felt supported by this program throughout my pregnancy					

I have been provided resources and programs I am eligible for through this program					
I understand how my emotions may change and have taken action regarding how I feel over my pregnancy					
I understand the importance of breastfeeding my child if I am able					
I understand the importance of doing regular pelvic floor and other exercises during pregnancy and have taken action to do so					
I understand the importance of my diet during pregnancy and have taken action to change this appropriately					
I understand the importance of not smoking or using drugs during pregnancy and have taken action to stop any harmful habits					
I understand what to expect during labor and delivery and have documented my birth plan					

Results

Table 3 overviews baseline demographics of the control and intervention groups. 1,482 pregnant mothers were identified as prospective candidates for the intervention and 16,911 were identified for the control. Members across both groups were predominantly African American or Caucasian with their primary spoken language being English. A small percentage of members spoke Arabic as their primary language across both groups and members skewed older in the control group versus intervention.

Table 4 and Figure 1 summarizes demand results. Of the 1,482 prospective mothers, 477 were successfully contacted over the phone. 8,965 members were successfully contacted over the phone for the standard CFL program over the same time period. When compared to the control CFL population, success rates when attempting to access members through phone outreach were lower in the intervention group than in the control (32.2% *vs.* 53.0% (p=<0.01 95% CI for difference (-23.3%–-018.3%))). However, of the successfully contacted members, 47 attended 2 or more events in the intervention group versus 268 individuals in the control. This is visualized in **Figure 1**. Attendance was higher in the intervention group *vs.* the control CFL population (3.17% *vs.* 1.58% (p=<0.01 95% CI for difference (0.1%-2.5%))).

Table 5 details financial costs for the program. These were compared and broken down into labor, event and supplies. Costs were higher between the two groups at 53.9 cost units per member per event for maternity CFL maternity members and 12.7 cost units per member per event for standard CFL non-maternity members. Labor and event costs were the significant drivers of the cost difference. Overall the maternal CFL program cost 4.24 times as much as the standard CFL program.

Table 6 details responses for member satisfaction. A subsample of 44 members who attended virtual or in person events completed the survey as part of routine internal quality improvement activities. The average member satisfaction score across all domains was high, with 42 of surveyed members (95%) either agreeing or strongly agreeing across all 8 domains.

All individual themes were high with the lowest assessment score being understanding of labor and documentation of a birth plan with 95% of respondents either agreeing or strongly agreeing. Assessment of knowledge, attitudes and beliefs around knowledge for resources, emotional support, breastfeeding, diet and smoking abstinence was universally high with 100% of respondents either agreeing or strongly agreeing after engagement with the program.

Table 3: Baseline characteristics of eligible members for the intervention and control group, displayed as member counts and overall percentages.

Baseline characteristics	Intervention group (n=1,482)	Control group (n=16,911)
Age		
18-30	1059 (71.5%)	7764 (47.0%)
31-45	423 (28.5%)	8769 (53.0%)
Ethnicity		
American Indian or Alaska Native	8 (0.5%)	118 (0.7%)
Asian	9 (0.6%)	177 (1.0%)
Black or African American	773 (52.2%)	8807 (52.1%)
Caucasian/White	595 (40.1%)	6525 (38.6%)
Hispanic	0 (0%)	12 (<0.1%)
Native Hawaiian or Other Pacific Islander	2 (0.1%)	15 (0.1%)
Unknown	95 (6.4%)	1257 (7.4%)
Primary language spoken		
Arabic	41 (2.77%)	874 (5.2%)
Bengali	1 (0.1%)	17 (0.1%)
English	1429 (96.4%)	15851 (93.7%)
Other	1 (0.1%)	40 (0.2%)
Spanish	10 (0.7%)	108 (0.6%)
Unknown	0 (0%)	21 (0.1%)

Table 4: Overall conversion metrics between the standard Medicaid CFL program when compared to the mothers CFL program displayed as member counts and percentages to three significant figures. Pearson's chi squared test for equality of proportions with continuous correction used to assess difference in percentages.

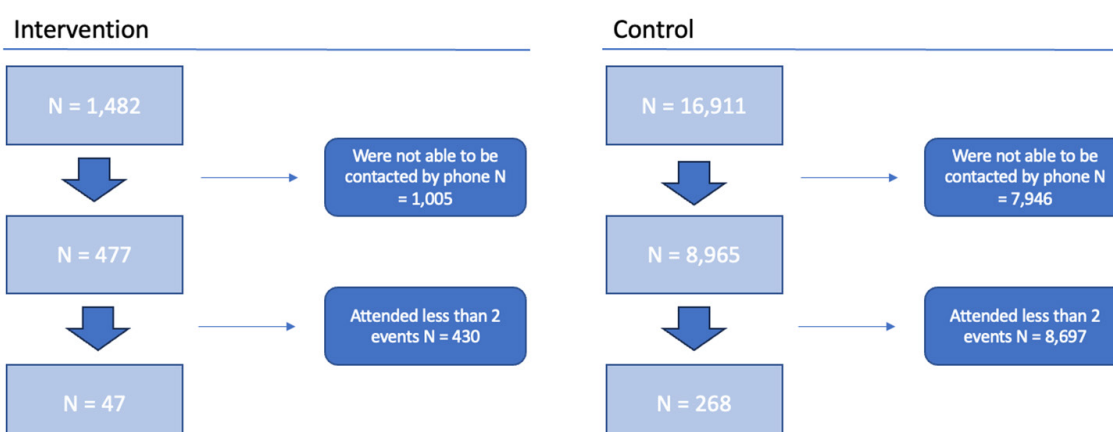| Contact modality	CFL maternity program (n=1,482)	CFL standard Medicaid program (n=16,911)	95% CI for difference between percentage of population able to contact
Successfully contacted over the phone	477 (32.2%)	8,965 (53.0%)	95% CI (-23.3%--18.3%)**
Note: **p=<0.01.			

Figure: 1 Overall conversion metrics between the standard Medicaid CFL program when compared to the maternal CFL program displayed as member counts.

Table 5: Breakdown of costs for member acquisition to the nearest cent between maternity program and standard CFL program members.

Cost domain	CFL maternity program per engaged member costs	CFL standard Medicaid program per engaged member costs
Labor	45.4 units	10 units
Event	6.1 units	1 unit*
Supplies	2.4 units	1.6 units
Total	53.9 units	12.7 units

Note: *Smallest line item normalized to one unit per event. Other line items displayed as relative units to that item to protect confidential financial information

Table 6: Percentage of responses on five point Likert scale with agree or strongly agree for core thematic domains assessing satisfaction and overall knowledge.

Domain question	Number and percentage agreed or strongly agreed
I felt supported by this program throughout my pregnancy	N=43 (98%)
I have been provided resources and programs I am eligible for through this program	N=44 (100%)
I understand how my emotions may change and have taken action regarding how I feel over my pregnancy	N=43 (98%)
I understand the importance of breastfeeding my child if I am able	N=44 (100%)
I understand the importance of doing regular pelvic floor and other exercises during pregnancy and have taken action to do so	N=43 (98%)
I understand the importance of my diet during pregnancy and have taken action to change this appropriately	N=44 (100%)
I understand the importance of not smoking or using drugs during pregnancy and have taken action to stop any harmful habits	N=44 (100%)
I understand what to expect during labor and delivery and have documented my birth plan	N=42 (95%)

Discussion

The maternal CFL program, adapted from the Standard CFL program, when applied to a population of mothers enrolled in Medicaid in Detroit, appears to have higher demand than the Standard CFL program as indicated by the higher attendance engagement rate despite lower contact success. The maternal program was more expensive to deliver than the standard CFL program indicating the need to investigate further ways of reducing labor and event costs whilst maintaining user belief. The program is likely acceptable as indicated by the high rates of satisfaction from members.

The acceptability and demand results may be linked to the strong call to action that being an expectant mother brings and the variation in amount of support mothers in this cohort may find themselves with [20,21]. Through tailoring the program to speak to their needs and identifying members shared lived experiences, common issues and solutions were able to be highlighted, which may have resulted in the observed engagement and attendance. Through mixing groups with null and multiparous mothers, an environment may have been created where prior knowledge could be shared with members in a culturally competent manner and setting which may have allowed for more effective behavior change and improved attendance through leveraging positive deviance and social proof so that members would emulate actions and behaviours that were desirable from other members [22]. When combining this approach with the WC, CES who also shared those traits and could skillfully facilitate the events, it is possible conversations could be focused on issues that were applicable and had the highest value add to members in a manner that could be understood and allowed everyone to participate.

The nature of the research as a feasibility study makes it challenging to draw conclusions that are widely generalizable owing to the setup, sample size and single geography. The study did not use any claims based quantitative metrics to assess cost and quality metrics as the sample size was too small to conduct a narrow caliper propensity match to evaluate the program's impact. There may be an inherent selection bias in the surveyed members as those who responded to, engaged with the program and completed the surveys from the initial pool of members may have been further along in the process of contemplating engaging healthcare services and have a higher predisposition for positive behavior change [23]. This may have biased results to appear more positive than they may have been across the broader group.

Key messages regarding feasibility

What uncertainties existed regarding the feasibility?

The feasibility of adapting the standard CFL program using a mixed approach that combines peer support groups with a

facilitator CES who is locally hired with deep understanding of local issues, resources, culture and shared lived experience to their prospective members, in the running of these groups for expectant mothers in Medicaid populations in the United States.

What are the key feasibility findings?

The maternal CFL program appears to be a feasible peer support program for expectant mothers enrolled in Medicaid with member sentiment being high. The program has higher running costs than the standard CFL program, but its higher rate of attendance indicates sufficient demand amongst this Medicaid population to justify further exploration of lowering costs or exploring alternate funding mechanisms.

What are the implications of the feasibility findings for the design of the main study?

Program can now be rolled out with larger numbers of participants in more geographies, enabling broader claims based actuarial analyses on the cost effectiveness of the program. These studies will also power detection of differences in key quality metrics between those enrolled in the program and a control group, such as low birth weight, preterm delivery caesarian section rates and maternal and infant mortality, which are a focus for many managed care plans working with members enrolled in Medicaid. This could help shape recommendations around similar programs by policy and decision makers.

Conclusion

In conclusion, initial data from this feasibility study indicates that the WC maternal CFL program is feasible and programs like it may be valuable, given higher demand. To ensure scalability the program may have to be priced at a premium or use alternate funding sources to a standard per member per month arrangement. In parallel further qualitative research to further investigate effective ways to lower key drivers of cost around labor and events and whether shortening event duration and frequency can maintain similar sentiment would be useful. A deeper qualitative component to allow for exploration of participant responses around ease of attending events and perspectives of CES in delivering the intervention could support this. Through more studies with larger numbers of participants in more geographies, broader claims based actuarial analyses on the cost effectiveness and return on investment of the program will be possible and potentially justify alternate funding mechanisms. These studies will allow detection of differences in key quality metrics between those enrolled in the program and a control group, such as low birth weight, preterm delivery caesarian section rates and maternal and infant mortality, which are a focus for many managed care plans working with members enrolled in Medicaid. This could help shape recommendations around similar programs by policy and decision makers.

Ethics Approval

Research was conducted in accordance with the Declaration of Helsinki. The study was determined to be exempt from human subject research approval by Advarra IRB services with the following protocol number. (Pro00077613).

Availability of Data and Materials

Access to data is restricted given the study leverages confidential financial, operational and de identified survey datasets.

Competing Interests

Claude Pinnock, John Rothen, Yashwanth Nekirikanti and Dat Nguyen are current or previous employees of Wider Circle, the company that provides "Connect for Life (CFL).

Authors' Contributions

All authors contributed per ICMJE guidance. Claude Pinnock wrote the manuscript. Dat Nguyen conducted gathering of member data around conversion, cost and member sentiment. Yashwanth Nekirikanti and John Rothen provided the scientific analyses of the dataset.

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