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Implementation of a Community Health Worker (CHW) training program to improve birth outcomes

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Abstract

Background

Those who have been affected by any adverse childhood experience (ACE) have an increased likelihood of poor birth outcomes. These include low infant birth weight, preterm delivery and can even lead to pregnancy loss.

Problem

Latina women have been identified by the Centers for Disease Control (CDC) as those most affected by ACEs. Further evidence supports those affected by 2 or more ACEs have poor birth outcomes.

Context

For this project, The Save the Children organization in partnership with the University of San Francisco Doctorate of Nursing Practice (USF DNP) students and Community Health Workers (CHWs) of the Central Valley of California came together with the goal to positively impact the birth outcomes of future generations.

Interventions

CHWs were provided training developed by an advanced practice nurse. Educational sessions were online and in person and included topics of adverse childhood experiences, trauma informed care, perinatal mood and anxiety disorders, encouraging healthy habits along with various resources available to CHWs and those within their communities. Educational sessions included lecture type presentations in addition to robust discussions. The education and subsequent implementation of CHWs working with pregnant Latina's facilitated a decrease in

health care costs, adoption of healthier choices for mother and child, and providing support and connection within a community.

Measures

This quality improvement project assessed the education and motivation levels of CHWs. Pre and post assessments were given for each module taught. Three modules were taught over four to five hours of nurse led training and education over a three month time period.

Results

Post assessment data revealed that CHWs had increased their knowledge of the educational topics taught. Additionally, CHWs showed an increased motivation by having the educational program and support from the advanced practice nurse.

Conclusions

Latinas are more at risk for poor birth outcomes in Central California due to the amount of ACEs experienced. Evidence based research supported the intervention of implementing a nurse led training program for CHWs. With increased knowledge and motivation of the CHWs, validation was further given that CHWs will greatly impact their communities by having the education necessary to decrease low birth weight (LBW) infants, preterm births (PTB), and pregnancy loss or miscarriage.

Keywords: community health worker, promotora, birth outcomes, pregnancy loss, low birth infant, improved outcomes, Latina

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Background

Adverse childhood experiences (ACEs) have impacts on morbidity and mortality later in life as identified by The Centers for Disease Control and Prevention (CDC, 2021). More specifically, the stress responses activated can negatively affect pregnancy and delivery for those who experience ACEs which in turn increase the likelihood of experiencing pregnancy loss or preterm birth (PTB) (Mersky & Lee, 2019; Sulaiman et al., 2021). ACEs include "physical abuse, sexual abuse, emotional abuse, physical neglect, emotional neglect, household substance abuse, household mental illness, household crime, domestic violence, and divorce/separation" (Mersky & Lee, 2019, p.2). The CDC identified women, who were either Black, Latina or those other than White to be at a much greater risk of experiencing one or more ACE (Merrick et al., 2019). When women experience two or more ACEs, their likelihood of PTB increases two-fold (Sulaiman, et al., 2021). For each additional ACE the odds of pregnancy loss increase by 12%, PTB by 7% and delivery of low birth weight (LBW) infants by 8% (Mersky & Lee, 2019).

Problem Description

The education and implementation of CHWs has shown that providing community support can change this narrative and significantly contribute to addressing barriers to care and improve birth outcomes for Latina women who have experienced ACEs. Such birth outcomes include decreasing rates of pregnancy loss, PTB, LBW infants, and furthermore decreasing the amount of healthcare costs incurred by the woman and infant once delivered. CHWs provide support in ways that not only address the needs of the woman and infant directly, but they offer support to the family unit which very often influences other health behaviors like breastfeeding

(Boyd, et al., 2021; Falicov. et al., 2020; Pan, et al., 2020; Sandhaus, et al., 2018; Valenzuela-Yu, et al, 2018). Furthermore, the implementation of CHW's in low- and middle-income countries has shown a decrease in depressive symptoms in postpartum women (Rossouw, et al., 2021).

The implementation of support resources for women in the community is essential in the transition period of growing and delivering a child. Support of pregnant and postpartum women can be given by CHWs, as they enhance professional care and reinforce birth preparedness and complication readiness (Kalisa, et al., 2018). In addition, CHWs who provide trauma informed care (TIC) can meet the sensitive needs of the women who have experienced ACEs. TIC includes increasing provider awareness, implementing additional perinatal screenings, and enhancing communication skills to improve care for those women who have experienced trauma or adverse experiences in their lives (Sperlich, et al., 2017).

Setting

This quality improvement project took place in the Central Valley of California in partnership with The Save the Children organization and the University of San Francisco students in the Doctor of Nursing program. The letter in Appendix A is evidence of the partnership with The Save the Children organization.

The Central Valley of California has a primarily Hispanic population. The approximate household income ranges between $45,000 and $59,000. About 15% of the population lives in poverty (U.S. Census Bureau, 2021). The population in the Central Valley identifies a need for change to improve the health of the community.

Specific Aim (Purpose)

The purpose of the project was to challenge the rates of poor birth outcomes that currently exist for Latina women who have experienced ACEs who live in the Central Valley of California. The implementation of a training program and toolkit for CHWs, led by an advanced practice nurse, ultimately had positive impacts on birth outcomes in Latina women, those who are most affected by ACEs and have an increased likelihood of adverse birth outcomes. CHWs provided education and support to the community in the California Central Valley. With education and support, women within the community have the information to make healthier choices, knowledge about how ACEs affect their bodies and their pregnancy, and lastly, save millions on healthcare costs by decreasing their rates of preterm birth, low birthweight infants, pregnancy loss, emergency service utilization along with the possibility of generating new income for local hospitals or the public health department as the services for CHWs are now reimbursable.

Over the course of the program, the project lead developed, implemented and evaluated the education of CHWs who are part of the Save the Children program. The project lead developed a tool kit which focused on trauma informed care, ACEs, how ACEs affect poor birth outcomes for the Latina population, and ways to improve birth outcomes. Pre and post assessments were completed by CHWs which measured their knowledge and comfort levels before and after the educational material was presented from the tool kit. CHWs were in turn able to use the information from the toolkit and implement the topics into their home visits.

Available Knowledge

PICO(T) Question

The implementation of an advanced practice nurse led education program prepares CHWs to provide support in a rural Latina population who have experienced ACEs and improve maternal and fetal outcomes.

Search Methodology

Three databases were utilized to complete a thorough search: CINAHL, PubMed and SCOPUS. The following keywords were used: birth outcomes, preterm birth, miscarriage, adverse childhood experiences, Latina, Hispanic, and Black. A total of 213 articles were found. When the search terms of *community health nurse, promotora, birth outcomes, training* and *community support* were used, 47 articles populated. When trying to search with the term, Latina, search results reduced significantly. For this reason, searches were reviewed in more general terms of demographics. The MeSH term "California/epidemiology" was also used which provided an additional 22 articles. The search was limited to 2017-2022 to provide a more current selection of articles.

Articles reviewed included those where the population was described as low income and focused on the outcomes of PTB, LBW, or miscarriage/pregnancy loss. Excluded were articles which focused on specific ACEs and those outcomes. Included were pieces that focused on generalization of all ACEs. Of the English articles with full text available, search results were less than 20 in each of the respective databases. Articles chosen included: systematic reviews, qualitative research studies and analyses, prospective cohort study, implementation guidelines, and a secondary analysis of a longitudinal study.

A total of 15 articles were reviewed and synthesized for this paper utilizing the Johns Hopkins Nursing Evidence- Based Practice (JHNEBP) (Dang & Dearholt, 2017) Tools to ensure quality literature was used to support the purpose statement. Additionally, the JHNEBP

Appendix H was used to guide synthesis of the findings and can be reviewed in Appendix B. Of the articles reviewed, those that were Level II and of good and high quality, included a quasi-experimental, retrospective study, a prospective cohort study, and another quasi-experimental research study. Level III articles, were of good and high quality; a qualitative content analysis, a qualitative comparative study, and a quantitative, non-experimental large-scale cross-sectional data set review. The Level IV article was of high quality and was a suggested practice change. Lastly, the Level V articles were good and high quality and included a systematic review of literature aimed at quality improvement, a secondary analysis of longitudinal data, and a qualitative, multiple case study analysis.

Main themes identified from the articles addressed how CHWs can positively impact outcomes in women, especially those who are most affected by ACEs. The themes, discussed in the following sections, include identifying Latina women as an at-risk population, various influences CHWs have on birth or health outcomes, addressing barriers in community participation, and the implications for practice change within the area of maternal and child health (Boyd, et al., 2021; Falicov. et al., 2020; Sandhaus, et al., 2018; Valenzuela-Yu, et al, 2018).

Integrated Review of the Literature

Identifying the at-risk population

Latinas have predominately been most at risk when compared to White women due to their likelihood of experiencing any number of ACEs (Merrick et al., 2019). When identifying ACEs in the community it is important to recognize that ACEs greatly affect health outcomes. Health outcomes include “risks for injury, sexually transmitted infections, maternal and child health problems (including teen pregnancy, pregnancy complications, and fetal death),

involvement in sex trafficking, and a wide range of chronic diseases and leading causes of death such as cancer, diabetes, heart disease, and suicide" (CDC,2021). ACEs cause stress in the body which contributes to difficulties forming healthy relationships, keeping stable work, and utilization of substances (CDC, 2021). The CDC has further identified that to improve health outcomes, we can start by addressing the treatment of ACEs by first raising awareness of ACEs, promoting safe and nurturing relationships, and reducing the stigma associated with difficulties with raising children or mental illness. Teaching and supporting the community will change the health outcomes of future generations. Cost-efficient intervention is utilization of CHWs to educate and support Latina women in the community (Embick, et al., 2021; Falicov. et al., 2020; Sandhaus, et al., 2018; Valenzuela-Yu, et al, 2018).

The impact CHWs have on improving birth and health outcomes

CHWs have been an active part of positive change within the area of community and population health for all races/ethnicities, ages, and education levels (Smittenaar et al., 2020). CHWs offer support, education, and further resources (Boyd, et al., 2021; Cunningham et al., 2020; Falicov. et al., 2020; Sandhaus, et al., 2018; Valenzuela-Yu, et al, 2018). The ability to train and employ a CHW for practice is minimal as they require no formal education (Smittenaar et al., 2020). CHWs are lay persons who wish to impact their community. CHWs have shown improvements in decreasing the number of PTB infants and those born at LBW (Kalisa et al., 2018). CHWs cultivate a trust that is "an important indicator of quality in patient–provider relationships and predicts adherence to protective health behaviors" (Falicov. et al., 2020; Pan, et al., 2020; Sandhaus, et al., 2018; Selchau et al., 2017; Valenzuela-Yu, et al, 2018). CHWs can assist with case management, care coordination, and emotional support during pregnancy and the postpartum period (Cunningham, et al., 2020). CHWs assist in easing the burden for those who

do not have access to transportation or childcare services because they can offer home visits. Furthermore, CHWs contribute to decreasing healthcare costs due to the impacts they have on birth and additional health outcomes (Cramer et al., 2018; Falicov. et al., 2020; Sabo et al., 2021; Sandhaus, et al., 2018; Valenzuela-Yu, et al, 2018).

Decreasing the number of PTB and infants born at LBW.

Use of CHWs as an intervention in a quasi- experimental study showed that full term deliveries increased by 3%, women remained pregnant 0.3 weeks longer, and there was a 0.2% increase in birth weight (Cramer et al., 2018). In another quasi-experimental retrospective study, Latinas had deliveries that resulted in less LBW infants. LBW was defined as anything less than 2500g; very low birth weight (VLBW) was less than 1500g; and extremely low birth weight (ELBW) was less than 1000g (Sabo et al., 2021). For Latinas, the delivery rates of VLBW infants were 36% lower and 62% lower for ELBW. The decrease was regardless of gestational age (Sabo et al., 2021).

Home visits.

By offering home visits to women in the community, CHWs will reach those who are impacted by not having childcare or transportation. CHWs can assess the home environment and offer connections to further community resources if needed (Falicov. et al., 2020; Sandhaus, et al., 2018; Valenzuela-Yu, et al, 2018). Establishing a relationship with women early in pregnancy improved office visit attendance within the pregnancy. Visiting at least three times within the first week after delivery showed an improvement on maternal health behaviors, as well as for those with chronic disease diagnoses before pregnancy (Cunningham, et al., 2020; Smittenaar et al., 2020). Improved maternal health behaviors included exclusively breastfeeding and proper cord care (Smittenaar et al., 2020).

Home visits establish a relationship with the women and their support system. CHWs can talk with any support persons the woman might live with or have present often. The support system is very likely to influence the decisions the woman makes such as feeding preference of the infant (Smittenaar et al., 2020). Discussing beneficial health behaviors for the woman and her infant can lead to actualization of those behaviors. When supportive persons have the same education, they can encourage and influence the healthy behaviors (Boyd, et al., 2021; Kalisa et al., 2018; Pan, et al., 2020; Smittenaar et al., 2020).

Decreasing healthcare costs.

Use of CHWs improves healthcare costs (Cramer et al., 2018; Sabo et al., 2021; Smittenaar et al., 2020). For instance, the costs associated with an ELBW infant to survive is approximately $202,700. The costs associated with a healthy infant is approximately $1,100 (Sabo et al., 2021). The rates of ELBW infants were reported to be decreased by 0.2%, an estimated 16 ELBW cases, this totaled to about $3.2 million (Sabo et al., 2021).

Implementing CHWs also decreases the high utilization of obstetric triage areas and the ER (Embick, et al., 2021). Decreasing visits to these areas will minimize costs associated to tertiary care rather than when care can be given at a primary care site. Women found to have experienced ACEs have limited social support, and poor self-efficacy were more likely to utilize these services rather than attending regular prenatal visits (Mehta et al., 2017). Prenatal office visits were seen as inaccessible (Mehta et al., 2017). If CHWs can decrease the amount of PTB, LBW infants delivered, and encourage the proper use of services, then healthcare costs can significantly decrease as evidence by this data alone. With utilization of CHWs and the cost savings they provide, Cramer et al. (2018) states there will be a 90% return on investment of services rendered by CHWs.

Development and education of CHWs

In developing education curriculum for CHWs, literature supports that education can be presented in various manners to include “self-learning material, audiovisual programmes and hands-on training” (Singh & Singh, 2022). Furthermore, academic detailing has been suggested as an applicable approach as it consists of teaching in small groups, motivational interviewing, and interactive discussions with the team members (Kennedy, et al., 2021). As educated individuals, CHWs can deliver information and education to the community in which they serve. They not only form relationships for education but also for social and emotional support. Due to the adapting expectations of the CHWs as their role is more recently defined by governing bodies, it is suggested by Jam, et al., (2019) that the evaluation of the CHWs confidence levels be evaluated before and after education to determine the success of their implementation. (Kennedy, et al., 2021)

Summary/Synthesis of the Evidence

Evidence suggests that advanced practice nurses may lead education of CHWs to prepare them for engagement with the community. Connection with Latina women who have experienced ACEs is necessary early on in pregnancy and into the postpartum period. CHWs need to be trained to provide sensitive, TIC to address the needs of those affected by ACEs (Sperlich et al., 2017). Educational topics for women include positive health behaviors such as attendance to prenatal visits, benefits of exercise and healthy diet, benefits to mother and child with breastfeeding and postpartum care. To increase chances of success in connecting with the at-risk population, partnerships can be made with obstetricians within the community to reach pregnant women. Clinics who take Medicaid or Medi-cal will allow connections with women who are experiencing poverty. Furthermore, to reach additional pregnant women, it is suggested

to partner with Head Start and Early Start programs to reach those who have subsequent children and those who are of low-income status. To address the needs for all Latinas equitably there would need to be data collection of ACEs experienced by the woman during an initial intake. This will then define further if there are benefits for all women or only those who have experienced ACEs (Mersky & Lee, 2019).

Rationale

Theoretical Frameworks

The Health Promotion Model (HPM)

The use of theoretical frameworks will help guide the implementation of educating CHWs to decrease the rates of adverse birth outcomes in the Latina population who have experienced ACEs. Decreasing rates of adverse birth outcomes will improve the quality of health and life for this population. An applicable nursing theory is that of Nola Pender's, The Health Promotion Model (HPM). Pender focuses on having a positive outlook on health rather than absence of disease. And although the HPM was written originally in 1982 to target individual health, it has since been successfully applied to groups and communities. When applying the HPM, nurses will assess the behaviors of three areas: personal characteristics and experiences; behaviors-specific cognition and affect; and behavioral outcome. The HPM's goal is to promote healthy behaviors through interactions which motivate the adoption of healthy behaviors which leads to overall health (Aqtam & Darawwad, 2018; Pender, 2011).

The components of the HPM include: individual characteristics and experiences, behavior with regards to specific cognitions and affect, and behavioral outcomes in health promoting behaviors. The HPM makes four assumptions: individuals strive to control their own behavior; Individuals work to improve themselves and their environment; health professionals

comprise the interpersonal environment, which influences individual behaviors; self-initiated change of individual and environmental characteristics is essential to changing behavior (Pender, 2011; Pender, et al., 2011). When applying the HPM it is important to determine which phase the individual is in: pre-contemplation (PC), contemplation (C), planning/preparation (P), action (A), and maintenance (M). The nurse can assess where the individual is at, their beliefs that influence the health promotion and further determine a plan of action to implement and maintain the proposed change of behavior (Khodaveisi, et al., 2017; Pender, et al., 2011).

When the HPM is applied to the education of CHWs the outcome is twofold. The improved health behavior is first noticed in the CHWs as an increase in knowledge or motivation, and then passed on to those who receive the education and support from the CHWs. For the purposes of this project, when educating the CHWs the focus was the motivation and confidence the CHWs each have before education and after education. The HPM has been applied to various age groups, to those with various health conditions, and even to women in the perinatal period (Aqtam & Darawwad, 2018). The HPM is a great fit for implementing the education of CHWs to provide community support and to further improve birth outcomes for Latinas who have experienced ACEs. Once educated, CHWs will be able to positively encourage healthy behaviors such as regularly attending pre- and post-natal visits, emotional support and encouragement, breastfeeding, and additional healthy behaviors (Khodaveisi, et al., 2017; Pender, et al., 2011).

Promoting Action on Research Implementation In Health Services (PARIHS)

A supplementary, applicable framework is the Promoting Action on Research Implementation in Health Services (PARIHS) as shown in Appendices C and D. PARIHS was developed in 1998 with the aim of improving practice, introducing new ideas, and implementing

guidelines (Kitson et al., 1998; Kitson et al., 2008). The initial authors included Gill Harvey, Alison L. Kitson and Brendan McCormack. Later it was altered when working with Jo Rycroft-Malone and a review team. PARIHS framework has guided many programs through implementing evidence-based changes since its inception (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone, 2004).

For successful implementation three components are required, evidence, context and facilitation. Each component is evaluated on a scale of low or high. When each component is deemed as high level, then implementation is likely to be successful. For successful implementation, there should be clear evidence used to support the implementation, an appropriate setting for implementation, also known as context, and lastly, facilitation to ensure changes are successful (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone, 2004). Supporting evidence can include research literature, clinical experience, patient experiences, and local records or information. Context, or identifying an appropriate setting includes identifying current culture, transformational leadership to ensure effective teamwork, and evaluation or feedback from participants. Participants may be individuals, a team or at a system level. Facilitation is comprised of enabling others to have a purposeful role in the implementation and honing in on skills or attributes to carry out holistic care (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone, 2004).

The PARIHS framework supports education and training of CHWs to improve birth outcomes in the community. Research includes an evaluation of quality literature to support identifying the need of CHWs within the community. Context pertains to how the use of CHWs applies to the Latina population. Evaluation will include a survey of CHWs and their confidence in being prepared to engage in teachings and provide resources before and after participation in

DNP-PMHNP student nurse led trainings. Facilitation will occur by providing appropriate education to ensure CHWs are properly prepared for their role, including training on providing TIC. Implementation of CHWs will decrease the rates of adverse birth outcomes of Latinas who have experienced ACEs with guidance by the PARIHS framework.

Methods

Context

The key stakeholders identified in the project include: the CHWs, USF DNP students, USF faculty partners, Fresno community members, the Fresno County Department of Public Health, Tulare County, and community leaders. The identification and prioritization of theses stakeholders is shown in a visual in Appendix E.

Interventions

The project consisted of a curriculum put together by the USF DNP-PMHNP student to educate the CHWs. There were a total of three modules that were delivered over a course of four to five hours. The following topics were covered in the curriculum: ACEs and how they affect pregnancy, What is TIC?, Perinatal Mood and Anxiety Disorders (PMADs), healthy habits to encourage community members to practice, identification of when to reach out for help, and numerous community resources to share.

Gap analysis

Currently the Fresno County data suggests that the rates of PTB, infants born of LBW and the infant mortality rates (IMR) are either barely meeting the Healthy People 2020 standards or not being met at all. Additionally, when rates are compared to those of the state of California there are significant differences found (FCDPH, 2019 & Healthy Fresno County, 2022). The

quality improvement project aimed to fill this gap and meet the standard of care for all women that result in better birth outcomes. The gap analysis is shown as a visual in Appendix F.

GANTT Chart

The timeline of the quality improvement project began in January 2022 when the development of the manuscript provided the rationale with evidence for the basis of the project. It continued to the curriculum development which occurred Fall 2022 with education implementation beginning in Spring 2023. Data was collected, evaluated, and analyzed in the time between implementation and the presentation of the DNP project in Fall of 2023. The timeline is presented in the form of a GANTT chart in Appendix G.

Work Breakdown Structure

The work breakdown structure can be found in Appendix H. It further details the timeline with regards to the initiation, planning, execution, closeout, and conclusion phases of the project. These are the details of what was completed for each step of the project in order to be successful.

Responsibility/Communication Matrix

The communication plan included various meetings with USF DNP students collaborating on the project, the USF faculty and the CHWs. Majority of the communication happened during the implementation phase which occurred in Spring 2023. Appendix I details the communication plan of the project with the stated stakeholders and the frequency of those communications including modality.

SWOT analysis

The SWOT analysis highlights the strengths, weaknesses, opportunities and threats/challenges to the project. Appendix J provides a visual of the descriptive below.

Strengths.

The strengths of this project are highlighted in the evidence mentioned above regarding the Healthy People 2030 goals and furthermore by the decrease in rates of poor birth outcomes that Latinas face when it comes to experiencing ACEs. This project directly addresses and fills the gap that the community needs for more education and support. Additionally, with CHWs now being nationally recognized, this gives further acknowledgement to the impact they have within the community. Lastly, CHWs have already established relationships within their communities which will increase the likelihood of successful participant recruitment.

Weaknesses.

The weaknesses of the program are limited but include the minimal and varied backgrounds in education it takes to become a CHW. Varied educational backgrounds meant that education needed to meet the needs of all CHWs who were at different educational levels with their different backgrounds, which included language barriers. Education needed to be adjusted after each educational session to meet the needs of the CHWs on the various educational topics. If another program was to be implemented, then the advanced practice nurse would need to be prepared to adjust the material as necessary for their cohort of CHWs.

Opportunities.

This project has a real opportunity to decrease the rates of poor birth outcomes for Latina women in Fresno County. The education benefits and supports the evidence already recognized, that CHWs can truly have an impact on their communities and contribute to the healthcare field.

Threats/Challenges.

The largest threat to the project is time, as birth outcome data is usually not produced immediately. The time that will be needed to show improvements in birth outcomes before and after implementation will take several years to see a difference. The second threat would be

finding CHWs who already have previous experience in the field and are bilingual in English and Spanish. If the CHWs already have experience it would bring professional knowledge to the team and further aid in the success of the project. When CHWs are bilingual in Spanish and English, they can communicate with those who are primarily Spanish speaking in the community. This will aid breaking down barriers to having community members participate in obtaining valuable knowledge and support what the CHWs can offer.

Comprehensive Financial Analysis

The budget for the project is very straightforward. The costs associated are the pay of the CHW and the time of the USF DNP student. The CHWs are paid by a local school district an average of $48,000 annually, however their costs are currently covered by a grant provided by the Save the Children organization. Appendix K illustrates the costs for the implementation of this project and Appendix L illustrates the startup costs over the first three years. CHWs are paid on average $48,000 annually. It would be suggested to start with 8 CHWs for simplicity in management of the program.

The cost of the USF DNP student was unpaid and consisted of the time it took in gathering evidence, developing the curriculum, and educating the CHWs. Appendix L highlights the costs associated with utilization of a DNP prepared nurse for education for implementation in a future state if there is no partnership with another University.

Appendix K goes on to compare the health care costs associated with deliveries of healthy, term infants and extremely low birth weight (ELBW) infants. Further, Appendix K illustrates the thousands of dollars that can be saved versus no implementation at all. The additional funds that are saved from health care costs can still be reallocated to other needs within the community; food insecurity, homelessness, or mental health resources which are all

additional difficulties that exist due to socioeconomic factors. The cost savings associated with implementation remain far greater than without implementation of the project at all.

Outcome Measures & Analysis

Outcomes were measured using pre and post assessments for each module of education taught to the CHWs. Canvas, a learning management system, was utilized for ease of data collection and privacy of assessment data collected. The desired objectives for the CHWs were to: identify 3 ways they can provide TIC, identify 4 ACEs and how they affect pregnancy, show a 40% increase in knowledge of PMADs, identify at least 4 healthy habits, and identify at least 2 reasons to reach out for help. Canvas was also used to help with analyzing the data from the pre and post assessments when implementation of the project was completed.

CQI Method and Data Collection Tools

The continuous quality improvement method used for this project included ongoing pre and post education assessments for each module taught. As well, assessments evaluated language used in educational material, the questions asked in discussions, and effectiveness of questions asked in pre or post assessments. Educational material was molded on an ongoing basis to meet the objectives of the project and the varying educational needs of the CHWs. Each pre and post assessment had five questions to verify the knowledge of CHWs with the goal of improvement from pre-education to post-education.

Ethical Considerations

To protect the validity and success of the project, it is important to highlight the ethical considerations. Considerations made for this project included the issues with privacy for the CHWs and where they were on their learning journeys. The use of Canvas ensured their privacy when pre and post assessments were taken. The ANA ethical standards met by the

implementation of this quality improvement project included that of Beneficence and Justice. These are appropriate because of the generous actions taken by the USF DNP student and the CHWs and how they were guided by compassion to provide services to a disadvantaged community. The act of justice as this community is provided the education needed to make positive changes and achieve good health. The Jesuit values that are applicable to the project are that of service. This is an enormous service project that took leadership, action by implementation and further, evaluation. This is a core Jesuit value that speaks to the USF mission, vision and values and added an additional ethical component.

Results

Measurement of successful implementation was obtained by analysis of pre and post assessments given for each education module taught. Pre and post assessments were via the Canvas platform. Prior to implementation of the training program, the goal was to have growth from the pre assessment to the post assessment. There were fifteen questions total, five questions for each module, that were composed by the USF DNP student. Overall, there was growth in 80% of the questions given. 3 questions, or 20%, were found to be of poor quality as there were mixed results. CHWs demonstrated growth in the knowledge of the educational topics taught. Additionally, there was increased motivation of the CHWs by having the educational program and support from the advanced practice nurse. This was finding was evidenced in the trainings themselves and the CHWs communicated messaged of having increased confidence as they felt prepared to share the knowledge they had with their community members.

Discussion

Summary

With the implementation of this quality improvement project, there is sufficient data to support the idea of how the education of CHWs can positively impact birth outcomes in Latina women who are most greatly affected by ACEs. There was a limited amount of literature that reflected communities of Latina women, and even less about Latinas effected by CHWs. This can be due to mistrust of the healthcare system or lack of resources, but further research would be needed to confirm this. Furthermore, randomized research trials are necessary to provide higher quality literature for review. Randomized trials can be conducted by collecting data on all Latina women, comparing data on ACEs they have experienced and then compared with their birth outcomes.

More research needs to be done on how to address ACEs with regards to mental health resources and various methods to treating trauma of ACEs. The CDC (2021) supports this by stating the beginning steps should include: bringing awareness to ACEs, promoting safe and nurturing relationships, and reducing the stigma with difficulties in raising children or mental health illness. Annual data of community delivery rates and details would need to be explored to see a larger perspective of the impact CHWs have on decreasing adverse birth outcomes.

To aid in collection of data to support the need within the Central Valley area, USF DNP student collaborators were able to experience a “ride along” experience. This interaction allowed the CHWs to report from their experiences the needs within their community. These were based on their prior experiences as CHWs. Having conversations with the CHWs allowed curriculum to be tailored to their needs prior to beginning live teaching sessions. With this initial interaction, the USF DNP student was also able to identify methods of teaching that would benefit the CHWs. These methods included use of case studies, open dialogue during presentations, and

identified the importance of including local resources for the CHWs to share with their community.

Interpretation

Implementing CHWs within the California Central Valley will positively impact birth outcomes. Specifically, CHWs help decrease poor birth outcomes in Central California for Latinas who are identified as being more at risk due to the number of ACEs experienced. Evidence based research supported the intervention of implementing a nurse led training program for CHWs. Their ability to educate Latina's within their community will decrease the rates of PTB, LBW infants, and result in less miscarriage or loss of pregnancy. Through subsequent education and support of the CHWs, the CHWs voiced having more motivation and confidence to take back to the Latina families within their communities. The advanced practice nurse aids in preparing the CHWs to change the future birth outcomes for this population.

Barriers and limitations

Literature suggested that barriers arose when it came to Latina women participating in studies or health programs. Majority of the population captured in the data reviewed was of White women. Identifying a large cohort of Latina women studied affected by ACEs was scarce. Selchau at al. (2017) identified that barriers to "care seeking and healthy birth outcomes included lack of insurance; isolation or unsupportive relationships; timid-ness and lack of self-advocacy."

In the Latina population specifically, there are also language barriers. Many tools are not available in the Spanish language (Sabo et al., 2021). CHWs who speak Spanish will better support the Latina's within the community where Spanish is their primary language. Any tools used should be translated prior to implementation of the material with the pregnant or postpartum

woman. When there are delays or barriers it is easy for the woman and/or the CHW to become disinterested in the process (Sabo et al., 2021).

Additionally, risks or barriers to educating CHWs and implementing their use within the community were touched on in the SWOT analysis mentioned previously. As the section of threats/challenges suggests, there are challenges with meeting the various education levels and experience of the CHWs. Additionally, meeting the language needs of the community by finding CHWs who are bilingual in English and Spanish. Literature suggests that CHWs who are older than 25 years old and have more education are more likely to perform better in health behavior changes (Ankur Joshi & Pakhare, 2022). Searching for CHWs with a baseline minimum education criterion can serve to set expectations. Also, adjusting the education delivered on an ongoing basis will address the differences in understanding as the project develops. To aid in this area, discussion boards were implemented on Canvas to have a place for questions to be asked and answered by either another more experienced CHW or the USF DNP student/project manager. Additionally, case studies and open discussions after presenting educational material served as catalysts for robust conversations which helped clarify topics, provide the USF DNP student an opportunity to identify and meet any gaps in understanding, a safe place to discuss prior experiences, and to role play for future situations.

Conclusions

Findings from the literature review, support the education and training of CHWs as beneficial towards impacting birth outcomes of Latina women who have been affected by ACEs. The implementation of this training program for CHWs will result in a decrease in the number of PTBs and in the number of infants born at LBW over time. With the opportunity to do home visits, CHWs can impact pregnant and postpartum women, their support systems, and further

promote beneficial health behaviors and actions as suggested by guidance of the HPM. Literature also supports the amount of funds that can be saved with the utilization of CHWs. Allowing CHWs to educate within their communities empowers them as healthcare providers and further supports their growth as being nationally recognized service providers. It would be appropriate for any community where Latina women live to implement the use of CHWs to do outreach and provide education during times of pregnancy and postpartum to improve birth outcomes.

Funding

This project was made possible by the collaboration of SaRonn Mitchell, the Senior Specialist of Early Childhood at Save the Children and Dr. Jo Loomis, USF faculty, to impact the health of those within the Central Vally of California. CHWs were partner staff of the Save the Children organization. The USF DNP student involved did not receive monetary pay but was able to use the time and experience of the project implementation towards their DNP culmination project.

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Appendix A

From: **Mitchell, SaRonn** smitchell@savechildren.org
Subject: Save the Children and USF Partnership
Date: October 31, 2021 at 5:32 PM
To: Jo Ann Loomis (jaloomis2@usfca.edu) jaloomis2@usfca.edu

SM

To Whom it May Concern:

It gives me great pleasure to be in partnership with USF and its students to bring much needed support and training to Save the Children's partner staff and the communities we serve. Our new and bold endeavor of building a Community Health Worker program, for example, will not only support families with understanding the importance of identifying a medical home, but will support our Early Childhood Coordinators/home visitors with a variety of interventions that will improve the overall quality of life and productivity for the communities they serve.

Since 2012, Save the Children and University of San Francisco have worked together in partnership to promote positive health outcomes for families and children in California's Central Valley. The USF students have provided health education and training for Early Childhood Coordinators/home visitors on topics such as breastfeeding education, oral health, child and family nutrition, and the effects of toxic stress and violence on children. The USF students were able to accompany the home visitors to provide nursing support with early childhood developmental screenings. These home visits were highlights of the experiences for USF students with the intention of providing them with deeper insight into some of the health needs of the families we serve, in rural America. This learning experience was vast in its approach as it included meeting program families and working with them on a one-to-one basis helped teach the need and create the 'heart' for many of the students to consider living and working in rural California. Working with the early childhood coordinators was an important part of these experiences, as they provided insight into the community needs to the USF students who many live and attend school in urban San Francisco.

Today, as we continue our work together, we will co-design a Community Health Worker training program for our local Early Childhood Coordinators/home visitors. Like our Early Childhood Coordinator, Community Health Workers literally meet families where they live, and see their economic, physical, and related mental health struggles on a daily basis. The Early Childhood Coordinators will be strategically positioned to provide support for the whole person as they assess the wide array of environmental, economic, and social determinants of health for this population. They visit with parents in their homes and see first-hand the effects of poverty, language barriers, and other social disadvantages that affect physical and mental health. This educational program will be designed to equip and enlarge the skills, attitudes, and behaviors of the early childhood coordinators as CHW to assess the whole person, in respect for the individual circumstances and needs of parents and families in the community, especially those families who experience traumatic and adverse determinants of health.

We are committed to creating new approaches to support systemic and collaborative community health-based initiatives that promote among other things, optimal birth outcomes and positive family and child outcomes. Furthermore, our early childhood coordinators will be better equipped during regular home visits to support families. Early Childhood Coordinators will provide families with health-related knowledge and tools to be better advocates for themselves as parents and for their children.

Again, I'm excited and look forward to working with USF and the USF students, so that these opportunities can continue to benefit USF students, Save the Children's partner staff but most importantly benefit the many families and children in the Central Valley our collective efforts will touch.

Warmly,
SaRonn Mitchell

SaRonn Mitchell
SENIOR SPECIALIST, EARLY CHILDHOOD
Save the Children.
CA & WA—Rural Education
Mobile: 559•313•7070

Appendix B
Evaluation Table

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA Reference: Cramer, M. E., Mollard, E. K., Ford, A. L., Kupzyk, K. A., & Wilson, F. A. (2018). The feasibility and promise of mobile technology with community health worker reinforcement to reduce rural preterm birth. *Public Health Nursing*. 35(6), 508–516. https://doi.org/10.1111/phn.12543							
The use of a smartphone application & CHWs to improve outcomes for women living in rural areas who often experience preterm birth. Reducing PTB will reduce need for further interventions as a premie reaches adulthood thereby decreasing healthcare costs for the community.	Experimental design research study. Difficulty recruiting teens and undocumented Latina- high risk population that community board wanted to reach Translation of forms into Spanish language slightly increased enrollment however was delayed.	Recruited by referral from OB at 5 different clinics in Midwestern Counties 114 pregnant women, 98 signed up. 21 didn't complete program- 4 miscarriage, 1 opt out, 16 moved/switched providers- no final delivery data available. Mostly White, married, educated, employed and had insurance.1/2 were Latina. 1/3 spoke other language (not English)	Enrollees planned to deliver at 1/3 rural hospitals, were < 24 wks, relatively low risk pregnancies (no CHTN, diabetes, those already predisposed to PTD) Given smartphone w/loaded app upon initiation of services & then collected at 36wks. Info was sent to enrollee: education links, appointment reminders, social service assistance.	1-Patient satisfaction using CSQ-8. And enrollment data. 2-Primary birth outcomes: preterm and low birth weight. Adherence to visits, Patient activation Measures (PAM)- for self care management. 3- health care costs (mother and baby) for total charges.	Higher scores in the intervention group with the extent to which the program met participant needs. Positive feedback comments from participants. Most participants already had smart phones, at home wifi and unlimited texting- didn't want to carry 2 phones ROI- cost of CHWs along with the program costs w & without cost of smartphones needed.	Delays can impact the interest and support amongst providers. Intervention group had more full term deliveries (3%), 0.3 weeks longer gestation, 0.2% increase in birth weight. Higher PAM sores- felt more confidence in ability to take care of problem/find solution or need to reach out to other provider ROI is 90% which signifies healthcare savings.	Level II, Good quality Groups were not randomized. Shows that support through use of CHWs and technology can be beneficial however have to strategies ways to break the barrier to reach the undocumented Latina and teen population as they are higher risk. Increase in PAM scores show benefits for all regardless of race/ethnicity. Empowerment. Organization at beginning sets tone for rest of implementation. Have language barriers figured out to reach those in need sooner/before roll out.

Definition of abbreviations: CHW- community health worker, CHTN- chronic hypertension, PTD- preterm delivery, ROI- return on investment, PTB- preterm birth

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA Reference: Cunningham, S.D., Riis, V., Line, L., Patti, M., Bucher, M., Durnwald, C., & Srinivas, S.K. (2020). Safe Start Community Health Worker Program: A Multisector Partnership to Improve Perinatal Outcomes Among Low-Income Pregnant Women With Chronic Health Conditions. *American Journal of Public Health*. 2020; 110:836–839. doi:10.2105/AJPH.2020.305630							
Use of CHWs to reduces the impact and incidence of chronic disease during pregnancy.	Prospective cohort study	Philadelphia, Pennsylvania Medicaid clinic 291 participants, Safe Smart Program Pregnancy w/preexisting diabetes, HTN, obesity, depression, or substance abuse and evidence of one or more missed appt Challenges include: Housing Food insecurity and other social determinants of health.	Ensuring patients received care and support they need before, during and after birth.	Perinatal outcomes between participants in Safe Smart and a comparison group. Adequate prenatal care, inpatient admissions, emergency visits, and postpartum areas such as making their postpartum visit, and receiving contraception after delivery.	Multivariable logistic and Poisson	Women feel unheard. Challenges with insurance, transportation, and child care Safe Start more likely to be African American, HTN, more likely to report substance abuse. Providing support with CHWs there was more prenatal care and less antenatal admissions.	Level II, good quality Identified no adverse effects by participating in Safe Start/access to CHWs. Discusses sustainability with partnerships within the community to have funding. Imperative nationally.

Definition of Abbreviations: CHW- community health worker, HTN- hypertension,

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA Reference: Kalisa, R., Smeele, P., van Elteren, M., van den Akker, T., & van Roosmalen, J. (2018). Facilitators and barriers to birth preparedness and complication readiness in rural rwanda among community health workers and community members: A qualitative study. Maternal Health, Neonatology and Perinatology, 4(1), 11. https://10.1186/s40748-018-0080-6							
To identify barriers to BP & CR among CHWs and community members in rural Rwanda. To understand the CHWs/facilitators	Qualitative content analysis Explored perceptions of CHWs & community members on BP/CR. CHWs use RapidSMS to improve maternal child health to enable CHWs and community communication. Community based health insurance pays for medical services.	Muzanze district, northern Rwanda w/population 368,267 Skilled birth attendance of 66% 1 hospital for High risk, 12 health centers and other district hospitals in the norther province. CHWs- women aged 45-68 & men 18-59. Randomization of 4 CHWs per health center.. 3 groups made up one focus group. Total of 8 focus group discussions held= 88 participants Key informant interviews	Steps taken to prepare for birth potential complications during birth in the community cultural and social issues surrounding BP/CR recognition of maternal and newborn danger signs access towards skilled care and challenges at the community level.	In Kinyarwanda language	Interviews were transcribed and translated into English. Transferred into NVivo 10 software to aid in coding the data.	Pathway- financial savings to have means to pay for care and supplies prior to labor. Link to care- CHWs were often first questioned about pregnancy/care. Social and emotional support- family and community come together to discuss how to keep pregnant woman safe. Modifying Factors- Social factors- Costs were perceived as high. Lack of availability of ambulance for transport to hospital for further care. Health policies- fines inflicted on those who delivered en route to hospital or at home	Level III, Good quality CHWs enhanced professional care and reinforced BP protein/CR messages CHWs aided skilled birth attendance Mobile phone technology with use of CHWs can have improved quality of care for the patient. Barriers: fear of being tested for HIV, being asked to return with the partner, distance to health facilities, rudeness reported, Participants were paid for their time

Definition of abbreviations: BP- birth preparedness, CR- complication readiness, CHWs- community health workers

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA Reference: Mehta, P.K., Carterb, T., Vinoya, C., Kangovi, S., & Srinivas, S.K. (2017). Understanding High Utilization of Unscheduled Care in Pregnant Women of Low Socioeconomic Status. *Womens Health Issues*. 2017; 27(4): 441–448. doi:10.1016/j.whi.2017.01.007							
To identify and review barriers to prenatal care in low SES groups who are high and low utilizers of care and how these barriers drive care	Comparative qualitative analysis of in-depth semistructured interviews	Participants from OB triage at Hospital of the University of Pennsylvania. Mar 2014- Aug 2014. Uninsured or Medicaid English speaking Pregnant (16wks gestation or greater- as seen in this triage area) 66 of 238 patients eligible, 40 enrolled Primarily African American	Attendance to prenatal visits Utilization of unscheduled visits: 4 or more as reported by the patient were high utilizers & low utilizers were recruited at 36wks or greater	Assessed for ACEs, social support, and pregnancy intention. Qualitative interviews taped, themes identified.	STATA 13.0	High utilizers were more likely to have experienced ACEs. Also faced barriers: psychosocial vulnerabilities while pregnant, illness &limited resources. Common in high utilizers to OB triage being more convenient. High utilizers shared being triggered by pregnancy from past ACEs, were more likely to name dysfunctional relationships and distrust and reported negative neighborhood features. Showed poor self efficacy. If this wasn't the case it was chronic illness within their lives which brought them for more frequent visits. Lack of coordination of services, time consuming. Felt stigmatized for high utilization. Low utilizers were more goal oriented and had support and have more positive neighborhood attributes.	Level III, high quality Incentivized participation with $15 dollar gift cards Findings are only applicable to the sample setting characteristics. Cannot be specific to low SES as did not compare dto high SES. Data set tables available

Definition of Abbreviations: OB- obstetric, ACEs- adverse childhood experiences, SES- socioeconomic status

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s)
APA Reference: Mersky, J. P., & Lee, C. P. (2019). Adverse childhood experiences and poor birth outcomes in a diverse, low-income sample. *BMC Pregnancy and Childbirth*, 19(1), 387. https://10.1186/s12884-019-2560-8							
The purpose of the article is to advance the literature of ACEs by reviewing the effects of reproductive health in low income women.	Secondary analysis of longitudinal data	Low income women w/children in Wisconsin who receive services (home visiting programs supported by Federal Maternal Infant & Early Childhood Home visiting program). Pregnant or delivered & have more risk factors (such as household poverty or substance use)	Birth outcomes: Loss at any gestation (miscarriage or stillbirth). Delivery at </= 36 weeks or </= 2500g ACEs: physical abuse, sexual abuse, emotional abuse, physical neglect, emotional neglect, household substance abuse, household mental illness, household crime, domestic violence, divorce/separation. Age at assmt/visit Race & ethnicity (Hispanic, American Indian, African American, Caucasian and other) Education (any post education)	Mean, Standard deviation and frequency of variables. ACE scores associated with linear increase in pregnancy loss, PTB or low BW w/control of age, race/ethnicity & education. 1-2 ACEs, 3-4 ACEs, or 5 or more ACEs compared to those in a reference group with ZERO ACEs.	Via SPSS	84.4% of low income women receiving these visits had at least 1 ACE 68.2% reported multiple ACEs. Elevated levels of childhood adversity undermine reproductive health- higher ACE scores were associated w/ higher rates of PTB, pregnancy loss and low BW. Each additional ACE increased pregnancy loss by 12%, increased PTB by 7% and increased odds of low BW by 8% OVERALL ACEs are associated generally with POOR BIRTH OUTCOMES.	Level V- High quality Genetic &Environmental causes differ across outcomes. Most research shows high ACE scores had associations w/ poor outcomes later in life. Later practice can include categorizing PTB and low BW. Self reported data can include a degree of error. Variables should also include epigenetics, genetics, biological, psychological & behavioral factors. Home visiting programs have potential to mitigate effects of ACEs and promote reproductive health.

Definition of abbreviations: ACEs- adverse childhood experiences, PTB- preterm birth, BW- birth weight

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s)
APA Reference: Sabo, S., Wightman, P., McCue, K., Butler, M., Pilling, V., Jimenez, D. J., Celaya, M., & Rumann, S. (2021). Addressing maternal and child health equity through a community health worker home visiting intervention to reduce low birth weight: retrospective quasi-experimental study of the Arizona Health Start Programme. *BMJ open*, 11(6), e045014. https://doi.org/10.1136/bmjopen-2020-045014							
Review of data to detail benefits of CHW program and impact on birth weight and preterm birth within the state of Arizona.	Quasi-experimental retrospective study	Arizona statewide CHW program records from 2006-2016. African American, Latina, American Indian High risk pregnancies (poverty, stress, low SES) Child 2yo or < than. 53948 births reviewed Most participants: <24yo, born in Mexico, Medicaid, preexisting medical conditions, had GED or high school diploma, married/cohabitating	Demographics Effectiveness of the Health start program with respect to the following elements: LBW <2500g VLBW <1500g ELBW <1000g (despite gestational age) & PTB <37 wks gestation	Participation resulted in LBW: lower for all except Latina. American Indian women had significantly lower rates of LBW (2.3% lower). LBW (25% lower rate) if had preexisting conditions. VLBW & ELBW).35% & 0.31% lower rates VLBW 36% lower for Latina & 62% lower for ELBW for Latinas PTB: reduced for all groups except American Indians & those with preexisting conditions	Arizonas Head Start Program had improved birth outcomes from 2006-2016 Costs of surviving ELBW is approx. $202,700 compared to $1100 for healthy infant. The program dec rate of .2% was approx. 16 ELBW cases = $3.2 million	Can maximize cost savings to work towards delivering at a higher birth weight and a later gestational age. CHW led programs with home visitations effect change in disadvantaged populations.	Level II, High quality Synthetic control group Largest study of CHW led home visitation program This program is sole comprised of CHWs.

Definition of abbreviations: CHW- community health worker, LBW- low birth weight, VLBW- very low birth weight, ELBW- extremely low birth weight, PTB- preterm birth, SES- socioeconomic status

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA Reference: Selchau, K., Babuca, M., Bower, K., Castro, Y., Flores, A., Garcia, J.O., Reyes, M.L.F., Rojas, Y., & Shattuck, L. (2017). Voces de la frontera/Voices from the Border: Using Case Studies of Pregnancy, Birth and Parenting along the U.S.–Mexico Border to Identify Shared Measures of Success. *Maternal and Child Health Journal*, 21 (Suppl 1): S19–S24. https://doi.org/10.1007/s10995-017-2375-z							
To study what are the common factors which affect healthy maternal and child outcomes, identify a definition for "what is success" when it comes to participants and to identify other areas for study/research.	Qualitative Multiple case study analysis (5 different states) Interviews which were open to participants stories on success by being in the Healthy Start Program	5 womens stories of the impact that Healthy Start had on their lives which led them to safety, encouraged them to pursue school and provided access to jobs and medical care for themselves and their children. All 5 were living along the border and here in the US for safety and to "live the American dream."	Determinants of success for individuals: Education attained, Employment, improved birth outcomes	Stories of success Identified barriers to care		"Trust is an important indicator of quality in patient–provider relationships and predicts adherence to protective health behaviors (p.S23)" There is a need for validating tools for success of a program like Healthy Start	Level V- good quality Personal Progress Scale (PPS-R)- a validated tool measuring: wellbeing, self-esteem, sense of belonging, agency & ability to make decisions in the household/community Barriers to care/ "healthy birth outcomes" included no insurance, isolation or unsupportive relationships, timid-ness, and lack of self advocacy. Limitations included a lack of standard work Stories were not randomized and might not reflect the whole population

Definition of abbreviations: HS- Healthy Start (program), CHW- community health worker, HSBA- Healthy Start Border Alliance

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA Reference: Smittenaar, P., Ramesh, B. M., Jain, M., Blanchard, J., Kemp, H., Engl, E., Isac, S., Anthony, J., Prakash, R., Gothalwal, V., Namasivayam, V., Kumar, P., & Sgaier, S. K. (2020). Bringing Greater Precision to Interactions Between Community Health Workers and Households to Improve Maternal and Newborn Health Outcomes in India. *Global health, science and practice*, 8(3), 358–371. https://doi.org/10.9745/GHSP-D-20-00027							
To identify how CHWs enable better birth outcomes	Quantitative study Non experimental Large scale cross-sectional data set	ASHA Program in India- worlds largest CHW program 2017-2018 5278 of the 5469 women were interviewed Knowing family dynamics that woman in India move in with MIL and spouse	Behaviors within the home Quality & timing of prenatal home visits improved health behaviors. Antenatal visits- knowing who to discuss care with. MIL is most beneficial to have contact with.	Logistical regression Demographics EIBF EBF rates Early bathing Clean cord care	Utilization of CHW improved rates of EIBF and EBF rates. Some CHWs believed that early bathing was best (33%) Had proper clean cord care	Can adapt the ASHA program to have even greater impact. Supports improvements in communication, knowledge and number and timing of visits. More postnatal home visits (3+) w/in the 1st week showed better health behaviors. Knowing cultural norms will help identify who to aim the teachings to, various support people involved.	Level III, Good quality No valid instrument used for collection of data. CHW impact health outcomes by having 3+ home visits. Bridge between the community & healthcare staff Home visits target mother support system- to share the same message. Not w/in our control is family dynamics. Use of technology to aid the CHW in use of behavior change strategies and identify households that can utilize the most support. Ongoing education for CHWs to keep up to date on EBP practice

Definition of abbreviations: CHW- community health workers, ASHA- Accredited Social Health Activist, MIL- mother in law, EIBP- exclusive initiation of breastfeeding; EBF- exclusive breastfeeding, EBP- evidence-based practice

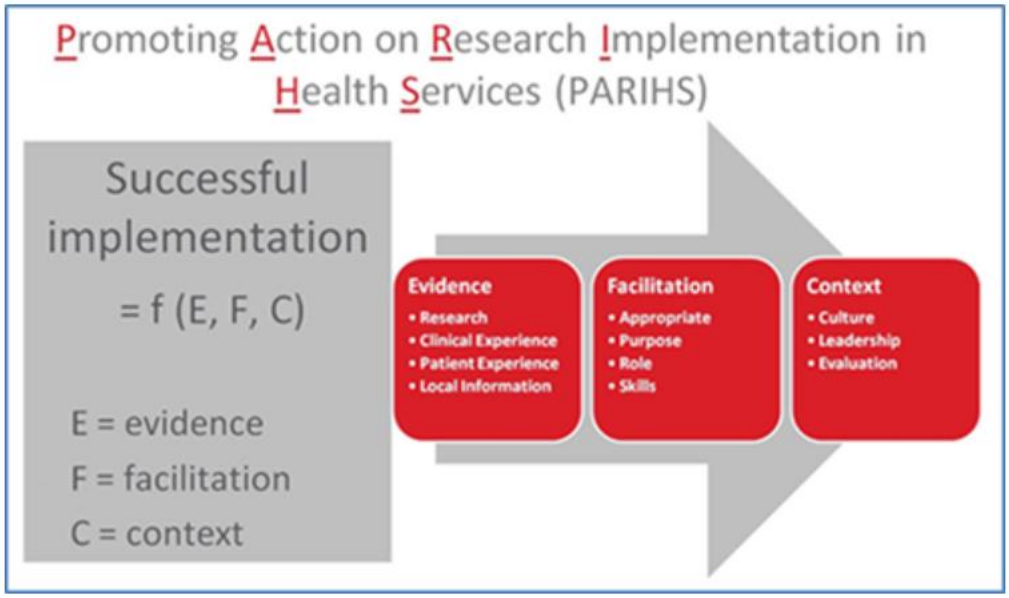
Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA Reference: Sperlich, M., Seng, J. S., Li, Y., Taylor, J., & Bradbury-Jones, C. (2017). Integrating Trauma-Informed care into maternity care practice: Conceptual and practical issues. *Journal of Midwifery & Women's Health*, 62(6), 661-672. https://10.1111/jmwh.12674							
To present current perspectives on trauma related sequalae of maltreatment & adversity To review the impact on childbearing outcomes To summarize technical assistance available about trauma- informed care (TIC) To discuss examples of conceptualization that lend themselves to tailoring trauma-informed care for maternity care Consider practical aspects of implementing trauma informed care	Integration of TIC into maternity care practice Trauma specific perinatal interventions.	Midwives providing perinatal care.	Childhood maltreatment & adversity on women. Sexual Abuse to the childbearing year. PTSD- dissociative and r/t depression & anxiety. Impact on childbearing outcomes and care. Traumatic stress and effects on Midwife care relationship Key concepts of TIC include: A stepped approach- all staff informedto respond to client behaviors, interactions, and needs using a trauma informed approach Organizational change- transformation of work culture, anyone can me affected by trauma, goal is to decrease toxic interactions and circumstances so clients and employees have a safe and supportive environment.	Midwife- client relationship: attachment, dyadic regulation (regulating emotions), and a holding environment (environment that a child feels to allow safety for feelings). Trauma specific perinatal interventions: 3 Es of conceptualizing trauma (trauma results from EVENT(s), EXPERIENCED that has lasting EFFECTS). 4 Rs for interacting/responding (Realizes, Recognizes, Responds, resist retraumatization), and the 6 key principles are essential practices for a generic framework (safety, trustworthiness & transparency, peer support, collaboration & mutuality, empowerment, voice and choice & cultural, historical, and gender issues).	Clients needing TIC have common themes: need for control, difficulty with disclosure, struggling with dissociation, hoping for healing, coping if remembering happens during pregnancy, and the extreme discomfort that comes with vulnerability	To launch TIC, need to implement screening for ACEs, other trauma history and PTSD. Screening for their types of trauma and what the priority needs are. ACE study questionnaire provided by CDC & PC-PTSD screening tool and PTSD checklist-5 for those who screen positive. Need to be able to not only identify need for TIC but that there are appropriate resources/interventions in place- ex: infant mental health services that work on dyadic and attachment Staff support- case conferences, encourage psychotherapy for those staff who have trauma history or PTSD.	Level IV, high quality Measuring positive outcomes such as posttraumatic growth and mothers self-efficacy to keep child safe from abuse. TIC integrated into midwifery care can break cycles of maltreatment, mental health disorders and the mother and childs life span, positively.

Definition of abbreviations: ACEs- adverse childhood experiences, PTSD- post traumatic stress disorder, NCTIC- National Center of Trauma-Informed Care, TIC- trauma-informed care

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA Reference: Sulaiman, S., Premji, S. S., Tavangar, F., Yim, I. S., & Lebold, M. (2021). Total adverse childhood experiences and preterm birth: A systematic review. *Maternal and Child Health Journal*, https://10.1007/s10995-021-03176-6							
Compile and criticize the literature guided by the question: What is the association between total ACEs and preterm birth?	Systematic Review	9 studies total Quality and bias- PTB and LBW as outcomes	287 studies on PubMed 75 PsychInfo 111 CINAHL 51 had full text review	Adequate measure of total of ACEs PTB needed to be the outcome.	Women of varying ethnicities Observational studies Data collected over phone or in clinical settings. Studies that had outcome of delivery w/either term or preterm birth (<37 wks was cut off).	Total ACEs at various times during pre and post natal period. Wellbeing & pregnancy questionnaire used 10 items from original ACE study Studies controlled confounding ptb factors such as smoking & alcohol use in pregnancy. ACEs and PTB: Every additional ACE increased PTB by 18%. 2 or more ACES increased PTB two fold. Sexual abuse alone increased premature delivery compared to those with no sexual abuse.	Level V, Good quality Unable to complete meta analysis due to lack of commonality in measuring tools, exposure measurement, sample characteristics. Variability in the demographics of the studies. Studies didn't explore the Mechanism of action and biopsychosocial pathways where ACEs influence health outcomes. (Allostatic load biomarkers) 7 or 9 studies were of high/upper middle income countries with majority of Caucasian participants. Bias of ACE data collection. Additional research needed.

Definition of abbreviations: ACEs- adverse childhood experiences, PTB- preterm birth, LBW- low birth weight

Appendix C



(University of Maryland, 2019).

Appendix D

PARIHS Framework

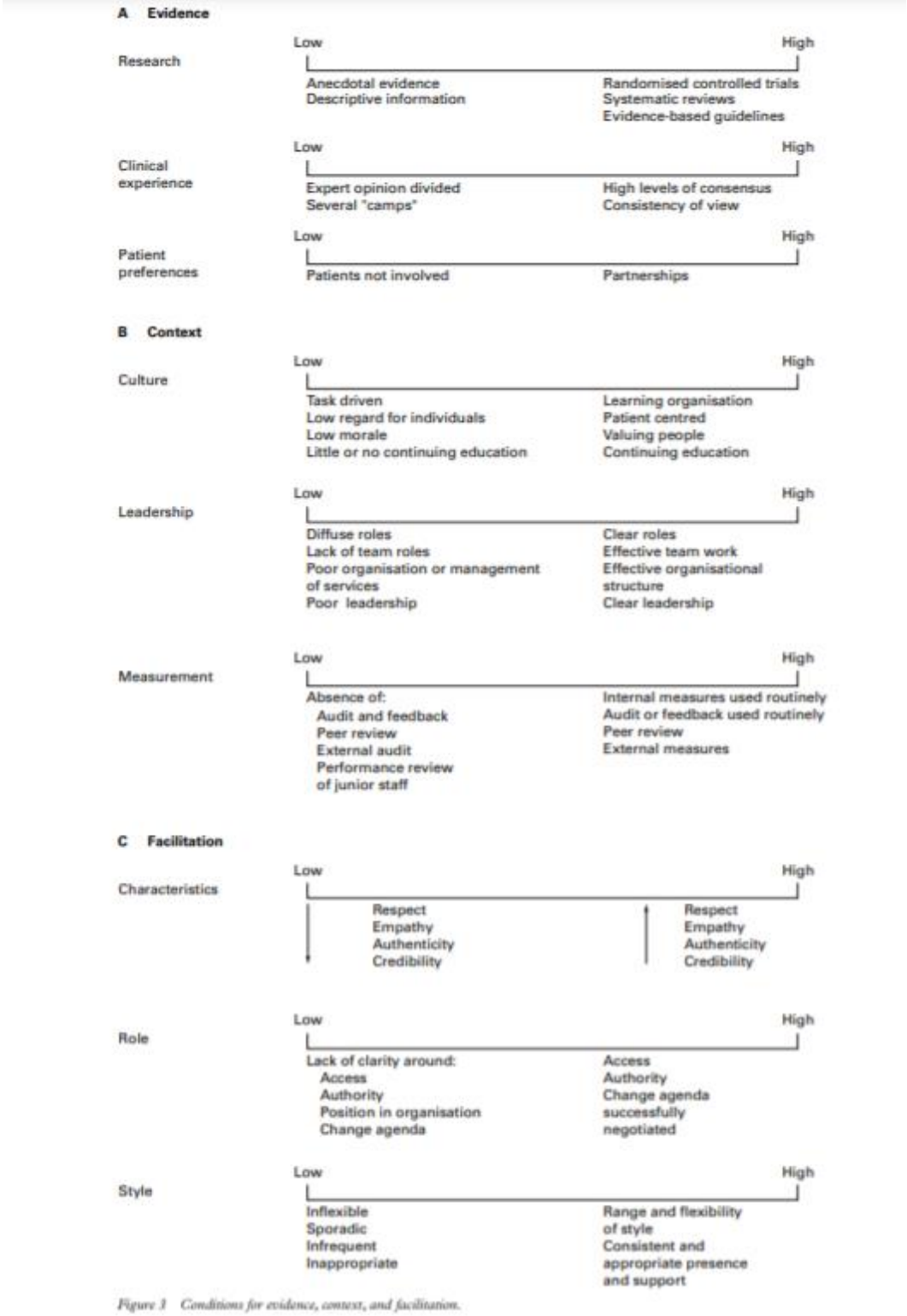
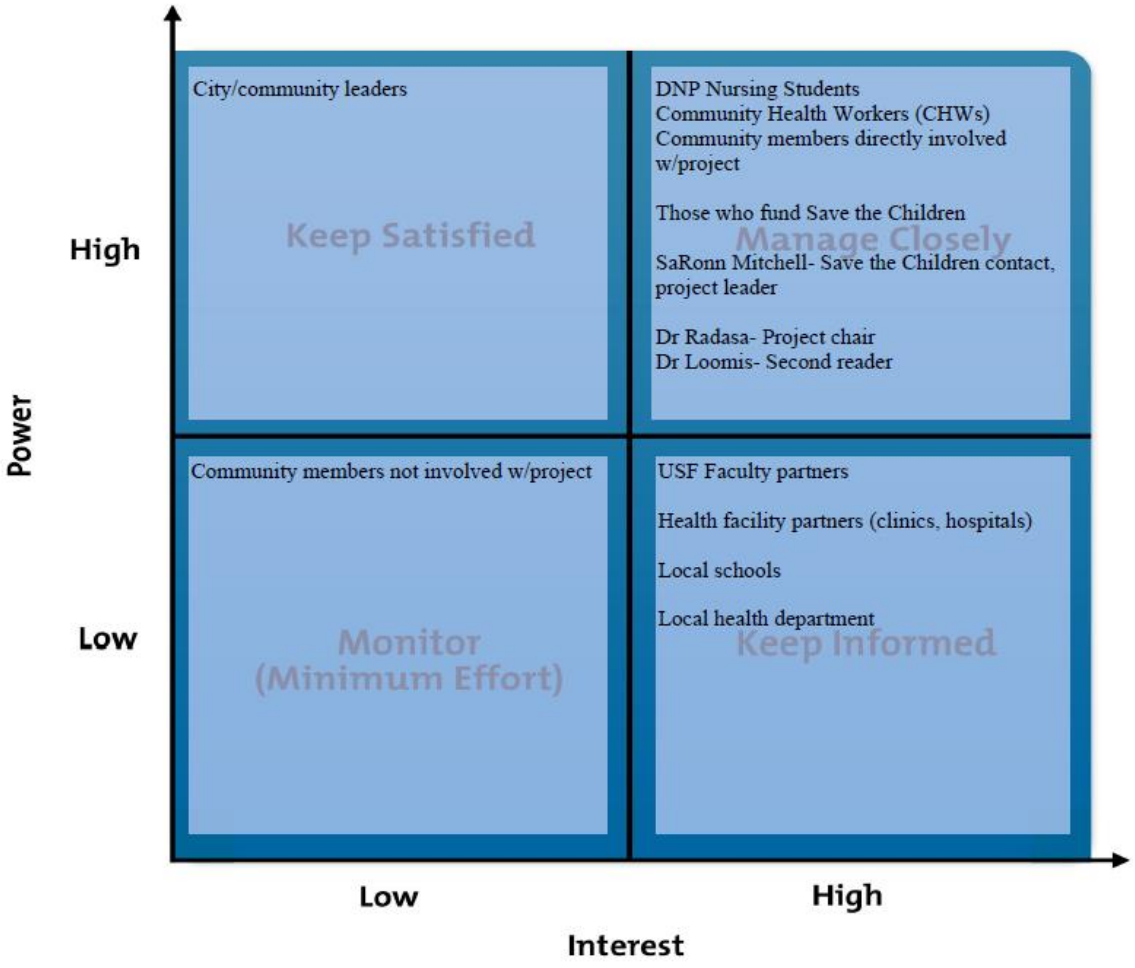


Figure 3 Conditions for evidence, context, and facilitation.

(Kitson et al., 1998)

Appendix E

Stakeholders



Appendix F

Gap Analysis

	Current State	Healthy People 2020/2030 goal	State of California	Goal State
Preterm births	9.4%	9.4%	8.7%	To meet the rate in California or be below. To show continued improvement would then put the rate below that of the Health People 2020/2030 goal.
Low birth weight infants	7.6%	7.8%	7.0%	Begin a downward trend in this category to meet the rates of California or below.
Infant mortality rate (IMR)	6.3	6.0	3.9	To start a downward trend to not only meet the Healthy People 2020/2030 goals but to continue the trend to then meet the rates of those in California.
IMR of Black infants	10.3	"	"	To start a downward trend to not only meet the Healthy People 2020/2030 goals but to continue the trend to then meet the rates of those in California.
IMR of Hispanic infants	6.6	"	"	To start a downward trend to not only meet the Healthy People 2020/2030 goals but to continue the trend to then meet the rates of those in California.

(FCDPH, 2019 & Healthy Fresno County, 2022)

Appendix G

GANTT Chart																									
	2022												2023												
Course/Event	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
749A- Manuscript Development	Spring																								
7005 Project Mgmt Project Plan Development					Summer																				
Create educational material for CHWs								Fall																	
Implementation of Education to CHWs													Spring												
Complete Pre & post assessments of CHWs													Spring												
Complete data collection, review objectives and analyze																	Summer								
Write up outcomes																				Fall					
Consolidate all data and evidence into presentation																				Fall					
Present findings for DNP defense presentation																							Fall		

Appendix H

Work Breakdown Structure (WBS)

Level 1	Level 2	Level 3
1 Save the Children collaborative with USF DNP students.	1.1 Initiation	1.1.1 Save the Children and USF faculty sign collaborative agreement
	1.2 Planning	1.2.1 USF lead faculty, Dr Loomis, identified topic to teach on 1.2.2 Determine Project Team 1.2.3 Project Team Kickoff Meeting 1.2.4 Develop Project Plan (Canvas)
	1.3 Execution	1.3.1 Recruitment of USF graduate students 1.3.2 Verify & Validate User Participation with topic chosen 1.3.3 USF DNP student developed content for educational sessions based on EBP. 1.3.4 USF DNP student organized a Canvas page for CHWs to access with educational material and resources. 1.3.5 Education began, go live. 1st cohort of CHWs /USF DNP students presented May 2022. 1.3.6 CHWs take pre assessments. 1.3.7 CHWs received educational material for improved birth outcomes, Spring 2023. After 4 to 5 hours of educational sessions, the semester will conclude. 1.3.8 CHWs take post assessments. 1.3.9 CHWs will implement learned material into their home visits & time spent with community members.
	1.4 Control	1.4.1 Project Management- Lauren B. & Dr. Loomis 1.4.2 Project Status Meetings- held PRN
	1.5 Closeout	1.5.1 Pre and post assessment data collection 1.5.2 Document Lessons Learned 1.5.3 Finalize and present findings 1.5.4 Archive Files/Documents

Appendix I

Communication Plan

Communication	Purpose	Channel/Method	Frequency	Target audience	Responsible Party
STC USF DNP student planning meeting	Communication with all USF DNP student and lead faculty to communicate the plans for the coming semester	Canvas/Zoom	Every semester	USF DNP students coming up to present	DNP student Lead- Lauren B. and Dr. Loomis
Course curriculum development	Communication with other DNP students to ensure there are no repeated topics/education modules	Canvas, Zoom & Google drive	Once	USF DNP students teaching on similar topics	DNP students in similar topics. ACEs; Me, Grace K. & Arelis
Spring 2023 team meetings	Planning of the semester when implementation is to take place	Canvas, Zoom, Google Drive	Weekly	USF DNP students teaching in Spring 2023	DNP project manager- Laruen B., Dr Loomis & USF DNP students
CHW meetings	Education of the CHWs	CHW Canvas	4-5 times within the Spring 2023 semester	CHWs	USF DNP student- Emiko Maruri
Guidance from USF lead faculty- Dr Loomis	Guidance as needed for project and curriculum development	Gmail, Zoom	As needed	USF DNP student	USF DNP student must reach out to lead USF faculty as needed.

Appendix J

SWOT Analysis

	Favorable/Helpful	Unfavorable/Harmful
Internal (attributes of the organization)	Strengths • Community need for more education and support (evidence-based). • CHWs are nationally recognized for how they contribute to positive outcomes. • CHWs have already established relationships within their communities.	Weaknesses • Minimal background education to become a CHW. • Language barriers.
External (attributes of the organization)	Opportunities • Showing improvements of birth outcomes over time to truly validate the impact CHWs can have on communities.	Threats • Time needed to show improvements in birth outcomes before and after implementation, over 5 years to really see a difference in birth data. • Desire for motivated, previously educated and preferably bilingual CHWs.

Adopted from: SWOT en.svg. (2020, November 5). *Wikimedia Commons, the free media repository*. Retrieved from https://commons.wikimedia.org/w/index.php?title=File:SWOT_en.svg&oldid=510267924.

Appendix K

Budget

Expense	Cost
Community Health Workers Early childhood coordinators Full-time, benefited $48,000 average annual salary per CHW (8) Paid by Save the Children/School District	$48,000.00 X 8 = $384,000.00
DNP student educator Total hours education: 8 hours 1 educator needed for this topic specifically	Unpaid
Total Cost of implementation	**$384,000**
WITH IMPLEMENTATION **Cost of healthcare for Healthy Infant** Average $1,100 each	If CHWs only worked with 2 women $2,200.00 **Total Cost- $386,200**
WITHOUT IMPLEMENTATION **Cost of healthcare for ELBW with a NICU admission** Average $202,700 each	**$405,400**
Savings to implement the program with best outcomes vs NO implementation.	**$21,400**

Appendix L

	Year 1	Year 2	Year 3
Expense	**Cost**	**Cost**	**Cost**
Community Health Workers Early childhood coordinators Full-time, benefited $48,000 average annual salary per CHW (8)	**$48,000.00 X 8 = $384,000.00**	**$48,000.00 X 8 = $384,000.00**	**$48,000.00 X 8 = $384,000.00**
DNP student educator $65.00 per hour average Total hours education: 8 hours 1 educator needed for this topic specifically	**$65.00 x 8 = $520.00**		
Supplies and Tools Chromebook for each CHW $99.99 each at Target	**$99.99 x 8 = $ 799.92**		
Total Cost of implementation	**$ 385,319.92**	**$384,000**	**$384,000**
WITH IMPLEMENTATION Cost of healthcare for Healthy Infant Average $1,100 each If each CHW saw 2 women in 1 year, that would be 16 deliveries affected	**$1,100.00 x 16 = $17,600**	**$1,100.00 x 16 = $17,600**	**$1,100.00 x 16 = $17,600**
TOTAL	**$ 402,919.92**	**$401,600**	**$401,600**
WITHOUT IMPLEMENTATION Cost of healthcare for ELBW with a NICU admission Average $202,700 each	**$202,700 X 16 = $3,243,200**	**$202,700 X 16 = $3,243,200**	**$202,700 X 16 = $3,243,200**
Savings	**-$2,840,280.08**	**-$2,841,600.00**	**-$2,841,600.00**
	Total Costs over 3 years with implementation: $1,206,119.92		
	Total savings over 3 years: -$8,523,480.08		