

Educational Strategy for Motherhood and Fatherhood: an Experience of Implementation in Soraca, Colombia

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Abstract

Background

Preconception education is one of the challenges in maternal and child health in Latin America, in countries such as Colombia. That is why the objective of the following research was to develop a pilot educational intervention aimed at pregnant and breastfeeding women, and their support network, to strengthen practices, skills and knowledge, for informed decision-making and the strengthening of self-care behaviors of women and childcare, beyond childbirth preparation in the municipality of Soraca, located in Boyacá, Colombia in 2017.

Methods

Quasi-experimental study with an intervention group (municipality of Soraca) and a control group (municipalities of Oicata and Sotaquira) which linked a process and impact evaluation to assess prioritized indicators in terms of maternal and child health and nutrition, before, during and after an educational intervention.

Results

The main results found that women considered the methodologies used in the educational sessions to be appropriate and relevant and recognized the importance of the call and home visit postpartum nurse. The strategy increased the involvement of the support network in training processes. In turn, the proportion of children who were breastfed was higher in the intervention group than in the control group (88% vs. 60% $p = 0.037$). The proportion of children who received a bottle was higher in the control group compared to the intervention group (57.1% vs. 16% $p = 0.006$).

Conclusion

Strategies such as the one developed in Soraca allow for improved health outcomes for the mother and child and their support network. The strategy 123 in Soraca was a clear example of how a prenatal educational intervention generates positive outcomes for mothers, infants, and their support networks in the areas of food and nutrition, emotional well-being, and physical health.

Background

The general health conditions of women before, during, and after pregnancy, as well as the health of their children, are cause for concern and present a significant challenge in public health. Inequity and poverty in a country are detrimental to maternal health. Worldwide, 99% of the half-million maternal deaths per year occur in developing countries [1].

In Colombia, for the year 2018, the maternal mortality ratio was 51.0 per 100.000 live births. It has been projected that by 2021, this rate would decrease to 24.7. On the other hand, in the poorest departments in the country as Chocó, Vichada, La Guajira, Córdoba, Guainía, Vaupés, and Putumayo, the observed mortality ratio is 5.48 times higher than the quintile of the departments with the lowest Multidimensional Poverty Index (2). Of these deaths, about 40% occurred by unclassified obstetric conditions, and 21% were caused by edema, proteinuria, hypertensive disorders in pregnancy, delivery, and the puerperium [2]. Although the Global, regional, and national levels and causes of maternal mortality during 1990 to 2013 reported that Colombia displayed a significant decrease in the maternal mortality rate in comparison with Latin American countries, still 50% of maternal deaths were attributed to causes related to unsafe abortion, maternal bleeding, and hypertensive disorders of pregnancy [3].

During the first thousand days of life, health education is considered a fundamental tool for the promotion and prevention of diseases due to the population has greater access to information, providing the skills to make decisions more consciously and with greater criteria of enforceability, regarding the access, and use of health services. Health education refers to the dissemination of key health messages, but also to the acquisition and strengthening of knowledge and skills that promote and contribute to the self-care and care of groups considered vulnerable such as pregnant women, nursing mothers, and children under the age of six years old [4].

The foregoing shows that both at the international and national levels, the importance of developing actions to reduce maternal and infant mortality and malnutrition of the mother-child binomial are recognized. In Colombia, baby friendly hospitals, -IAMII- (Instituciones Amigas de la Mujer y la Infancia Integral), and the integrated route of maternal perinatal care, among others, significantly involve components of training and education for women and their support network. In this regard, more evidence is required about the effects and impacts of educational interventions during the prenatal and postnatal stages offered by health institutions, to improve the general conditions of women and their children.

Therefore, the objective of this study was to develop a pilot educational intervention for pregnant and lactating women, and their support network in Soraca, a town located in the central province of the department of Boyacá, Colombia, to strengthen the practices, skills, and knowledge, to make informed decisions and strengthen self-care behaviors of women and care of children, beyond preparation for childbirth, called "En Soraca 123 por mí". This study was carried out through the alliance of three institutions, Fundación Santa Fe de Bogotá, Fundación Exito and Soraca health center.

Methods

Study design

The quasi-experimental study included an intervened group, and a control group linked the assessment of processes and impacts to evaluate the prioritized indicators regarding the health and nutrition of the

mother and child, before, during, and after an educational intervention developed during ten months in 2017.

Sample

The place of study was selected voluntarily by the Soraca health center and by the initiative to advance towards health education processes. The sample was defined using the information provided by the Soraca health center, as well as the vital statistics of the National Administrative Department of Statistics, in Spanish DANE on live births and low birth weight [5, 6]. The sampling universe was represented by pregnant women in the municipality. The control municipalities were Sotaquira and Oicata, which were selected by the indicators such as extension, unsatisfied basic needs (UBN), and several births, which are like Soraca and belong to the same central province (Table 1). Therefore, 33 pregnant women from Soraca and 21 pregnant women from the control municipalities Sotaquirá and Oicata were associated with the intervention.

Table 1. Description of indicators to the intervened and control groups

Indicator	Location		
	Soraca	Oicata	Sotaquira
Extension	57 km ²	59 km ²	288 km ²
Unsatisfied basic needs	46.26	51.64	37.48
Number of births per year	58	19	58

DANE, 2012

Study procedures

The initial strategy was to contact the pregnant women of Soraca through the information offered by the health center. Using this strategy, it was possible to have contact with 11 pregnant women. Therefore, an induced demand mechanism was developed where a nurse who worked in this project invited the entire educational community of the Simon Bolívar School to report the pregnant women they met in their family or sidewalk. Additionally, **broadcast**, radio campaigns, and delivery of communicative pieces to invite pregnant women were carried out, achieving a response of interest in participating from 61 pregnant women, where 33 pregnant women voluntarily joined and who met the following inclusion criteria of being residents of the municipality of Soraca, maximum gestational age of 25 weeks and express interest from the beginning to participate in the strategy (including educational sessions, home visits, phone calls, and meetings for the evaluation process).

The exclusion criteria for participation in the study including pregnant women, who did not reside in the municipality of Soraca and a gestational age greater than 25 weeks. In the control municipalities, the search mechanism was through the health center. Particularly, in Sotaquira was supported by a community leader recognized in the municipality.

Moments of the intervention

The design of the intervention included a contextualization phase with a qualitative research process, to map legal devices or normative frameworks of a conceptual, methodological, evaluation, and sustainability type. These aspects were considered during the design and provided inputs for the implementation and evaluation of the educational strategy.

In the development of this process, in addition to having the participation of the health center of the municipality of Soraca, public and private health institutions of low and medium level of complexity were consulted that provide care to people of various social and educational levels, as well as economic, to build a broad frame of reference for the design of the educational strategy and intervention. The first phase included a review of academic and non-academic documents related to training processes during the preconception, prenatal and postnatal stages. In the second phase, the information was collected directly with beneficiaries of preconception, prenatal, and postnatal education. The third phase focused on the collection of direct information, provided by academics and professionals from health institutions, in charge of designing and implementing health care and education processes, aimed at pregnant women, mothers, and children less than two years of age.

The educational intervention brought together seven steps (Figure 1), each of which included specific activities led by a nurse and supported by nutritionists, specialists in gynecology and pediatrics, physiotherapist, pedagogue, and social communicator.

Data collection

Measurement of processes

The collection of information was established within the framework of the procedures and tasks involved in the implementation of the intervention, both administrative and organizational, to establish effectiveness, and additionally identify opportunities for improvement along the way and its subsequent process of escalation, starting from the moments of the intervention (Figure 1).

The key points evaluated included the current situation of pregnant women and children less than two years of age, focused on improving and guaranteeing the general health status of the target population. Also, the objectives set were recognized when the implementation of the strategy began, strengthening the skills of health professionals and aspects to guarantee the implementation, sustainability, scaling of the strategy, and counseling skills in the professionals of the health center and the facilitator of the training process.

Impact evaluation

The impact evaluation was carried out in three steps of the collection of information through surveys with pregnant women both in the intervened group and in the control, before, during, and after the intervention, from March 2017 to January 2018. The objective of this collection was to respond to the performance indicators of the thematic axes in food and nutrition, emotional health, and body health and the expected changes in terms of knowledge, attitudes, and practices (Figure 2).

Similarly, the impact evaluation made it possible to measure the effects of the educational strategy on the beneficiary population through the following indicators: body mass index for gestational age, analogous pain scale, sleep quality index, and weight at birth in grams.

Data analysis

Semi-structured interviews allow to know in detail what a person thinks or feels about a particular issue or situation [7] allowing the same social actors to provide data related to their behaviors, opinions, desires, attitudes, expectations, which is very difficult to obtain through other means [8] They were carried in professionals from health institutions, pregnant women, and the support network of the control and intervened group.

Focus groups defined as a type of group interview that favors the exchange of opinions or debates where the degree of variety of points of view that exist on the same topic is shared [9]. These were developed in the pregnant women and their support network of the intervened group.

The interviews were transcribed. These transcripts were coded with the help of the Atlas.ti 7.0 software (Berlin, Germany). Categories were formed from the number of resulting codes, for their interpretation, theorization, and the construction of a semantic network (triangulation of information).

The impact evaluation sought to measure the effects attributable to the strategy. The proposed evaluation method was difference in differences, which is one of the main analysis methods proposed for quasi-experimental designs. This consists of applying a double difference. It compares the changes over time in the variable of interest between a population enrolled in a program (the treatment group) and a population not enrolled (the comparison group) [10]. For categorical variables, the chi-square test was calculated with the null hypothesis that there are no statistically significant differences between the two groups. The software used was Stata 13 (StataCorp, college station, Tex)

Results

Measurement of processes

In the intervened group, five interviews were carried out with professionals who designed the strategy, eleven with health center officials, ten with pregnant women, and six with the support network. In addition

to two focus groups with ten pregnant women. While in the control group twelve interviews were carried out. Thus, the main findings of this component were described as follow:

Perception of the media of dissemination of the strategy

There was a significant recognition of the different means of dissemination and contemplated within the strategy, both by the professionals of the Soraca health center and by the families of the pregnant and lactating women. In the readiness stage for the implementation of the strategy, the usefulness of the implemented promotion process was identified, which was reflected in that 87.10% of the women had heard about the strategy, of which 88.89% mentioned that they knew about the proposal objective and in all cases, they manifested to participate in it.

Participant 1: "Here we worked a lot of lines: we worked through radio broadcasting, we worked through printed broadcasting because there is a lot of printed material. There was a whole design line for the primers, for the folding ones, the large cardboard one, there was a whole strategy for the dissemination of good material in very good design, the strategy and it is also adjusted to Soraca" (Soraca health center official interview, 2017).

Training sessions

One of the first results of the strategy is the participation of mothers in the training sessions. At the baseline, it was found that 87% of the pregnant women did not attend any type of course or training, a situation that completely changed once the intervention was carried out, guaranteeing the participation of 90% of the pregnant women who were included in the evaluation. Additionally, the accompaniment of the support network went from 13% to 90%, including the mother and partner. It also stands out that, the satisfaction with the educational sessions was 59.3% satisfied and 40.7% very satisfied.

The pregnant women considered the methodology used in the training sessions adequate and relevant, as well as the content. None of the pregnant women interviewed made suggestions on topics that were not pertinent or inappropriate methodologies. Their evaluations were always positive in these two aspects. The time and frequency of the sessions were also considered adequate. They only suggested including topics related to domestic violence and appropriate stimulation for children.

Participant 2: "It seems innovative to me, that they give them as their kit of little things that they are going to do it in a didactic way that they are going to motivate how to bring their partner, yes? I see it as very didactic ... not so much to stand there and talk to them and tell them, but rather that I see that they are doing it as a game, as in practice ... as they reach them more, as more trustworthy, I see that innovative" (Soraca Health Center official interview, 2017).

The pregnant women from the control municipalities (Oicata and Sotaquira), mentioned their interest in knowing the different topics addressed in the strategy training sessions, especially it seems important to them to know about the feeding of both the mother and the child; pain and breathing management at the time of delivery; identification of warning signs especially in children, care for the baby.

Home visit and phone call

Both for breastfeeding women and their support network, home visits were very pertinent insofar as they allowed reinforcing knowledge, especially about the practice of breastfeeding, and they felt that their situation was important for the health sector.

Participant 3: "Well, it lasted four days that I did not flow milk until the nurse Andrea arrived ... already there, if the next day my milk started to flow too much ... if it had not been for her, she would be giving the baby milk from a jar, so I thank the boss for having scolded me because otherwise, it would have been because of that I had not given the baby milk, breast milk" (Soraca lactation focus group, 2017)"

Participant 4: "Well, very well because I thank you for that visit because let's say that they are pending as she is, I left her pregnant and now since he was drinking and they are still pending we are not forgotten that is very good" (Soraca support network interview, 2017).

Process assessment

Among the results generated from the implementation of the strategy that was mentioned and recognized by the health center of the municipality of Soraca were also included the acquisition and updating of knowledge of the issues that are addressed in the strategy. The health center considered increasing the time of the nurse's consultation with pregnant and lactating families so that they can have the counseling space proposed in the framework of the strategy and promoted the reference of the training process in other pregnant women who begin this stage to from your experience in strategy.

Participant 5: "A sister who is pregnant right now, I have advised her to come because of it is good for her and the baby and more than the baby right now this little girl, so, it helps her a lot to continue with the pregnancy and at the moment that she is breastfeeding again, which is good" (Soraca lactation focus group, 2017).

Key aspects for scaling up the strategy

Among the key aspects that emerged from the reports of the participating actors, to guarantee an escalation of the strategy, the need to facilitate access to health services is included, either because the services are provided in rural areas or because they are guaranteed the means of transportation that enable the assistance and permanence of the users and their families, to the programs that they offer in the health centers. This considering, that in the rural areas where the pilot was carried out, the population presents with a very precarious economic situation, and the distances between their places of residence and the health centers are quite wide, which has been an important factor in the dropout from promotion and prevention programs and care strategies for pregnant women, infants, and children under two years of age.

Impact evaluation

This component had three stages for collecting information both in the intervened group and in the control group. In total, 156 were carried out, distributed as follows: it is important to highlight that the initial sample in the intervened group and the control group were 33 and 27 pregnant women, respectively. However, throughout the process, some participants were lost. Among the main reasons, difficulties in contacting some pregnant women and non-participation in educational sessions were found in the intervened group, while the control group found a change of residence and difficulty for making the contact (table 2).

Table 2. Surveys carried out in the intervened and control group

Collection of information	Groups	
	Intervened	Control
Baseline	33	27
First monitoring	29	21
Second monitoring	25	21
Total	87	69

Food and nutrition axis

Regarding food during pregnancy, although statistical significance was not reported, some changes were observed in the average daily meals, being greater at baseline and follow-ups in the intervened group (4.7, 5.1, 5.8 mealtimes a day) than in the control group (4.3, 5, 5.2 mealtimes per day).

It was found that the proportion of mothers who received the recommendation to exclusively breastfeed their baby was higher in the intervened group than in the control group. Said proportion of the intervened group increased from the baseline, first follow-up, and second follow-up, going from 23.3% to 95.8% and 100% respectively, statistically significant differences in the first follow-up ($p < 0.01$).

Similarly, the proportion of mothers who reported knowing the benefits of breastfeeding was higher in the intervened group compared to the control group. This proportion in Soraca increased between the baseline and the first follow-up, going from 51.6% to 100%, which remained constant until the second follow-up, a statistically significant difference in the first follow-up and the second follow-up ($p < 0.05$).

In turn, the proportion of children who received exclusive breastfeeding was higher in the intervened group than in the control group (88% vs. 60% $p = 0.037$), respectively. Regarding the proportion of children who received a bottle, this was higher in the control group compared to the intervened group (57.1% vs. 16% $p = 0.006$).

Emotional health

Mothers in the intervened group recognized and handled one or two more emotional changes than those in the control group. The changes mentioned at this time include indisposition, irritability, worry, tiredness, joy, tenderness, sensitivity, uncertainty, anger, and sadness.

Body Health

The proportion of mothers who reported knowing the importance of breathing during pregnancy and delivery was higher in the treatment group vs the control group at the three measurement moments (36.8%, 96.2%, 91.7%) and (14.8%, 25.8%, 52.4%), it should be noted that in the first and second follow-up the differences were statistically significant in the second follow-up ($p < 0.001$) (table 3).

Table 3. Impact evaluation

Component	Control group (%)	Intervened group (%)
<i>Food and nutrition axes</i>		
Mealtimes a day (times a day)	Baseline: 4.7	Baseline: 4.3
	First monitoring: 5.1	First monitoring: 5
	Second monitoring: 5.8	Second monitoring: 5.2
Recommendation to exclusively breastfeed	Baseline: 20.0	Baseline: 23.3
	First monitoring: 64.7	First monitoring: 95.8**
	Second monitoring: 95.2	Second monitoring: 100
Knowing the benefits of breastfeeding	Baseline: 37.0	Baseline: 51.6
	First monitoring: 72.2	First monitoring: 100*
	Second monitoring: 73.6	Second monitoring: 100*
Exclusive breastfeeding	60	88*
Children who received a bottle	57.1	16**
<i>Body health</i>		
Knowing of breathing during pregnancy	Baseline: 14.8	Baseline: 36.8
	First monitoring: 25.8	First monitoring: 96.2**
	Second monitoring: 52.4	Second monitoring: 91.7
Total	Baseline: 27	Baseline: 33
	First monitoring: 21	First monitoring: 29
	Second monitoring: 21	Second monitoring: 25

Discussion

The results showed that it is necessary to resort to means of communication recognized by the community, such as the radio, which was used in the strategy named 123. A study in Nepal which investigated the impact of the mass media on the use of communication services for prenatal care in rural areas found that 60% of the participants had access to the radio and 43.4% to television and identified that mothers exposed to these media were more likely to attend the required prenatal care [11].

Likewise, the strategy allowed the participation of pregnant women and their support network in prenatal education programs to increase. Among the aspects referred to by the participants, it was found that the sessions were considered appropriate in terms of topics, content, and frequency. In addition, to the methodologies and involvement of the support network, this is related to existing studies. An investigation carried out with a couple of pregnant women in health centers in Malawi indicated that the parents stated that the content of the sessions covered essential aspects of maternal health and both the frequency and the duration of the meetings were appropriate [12]. In Ontario, Canada, a study that evaluated the change in knowledge associated with participation in prenatal education programs found that most pregnant participants (n = 511) were satisfied with the content covered during the course [13].

Another key aspect was the postpartum home visits made by the 123 Nurse. A field trial carried out in Isfahan Hospital in Iran found that the knowledge of mothers' maternal and child health was higher in the intervened group which had received care postpartum [14], like what happened in Soraca. Similarly, the assessment of the process by the health center allowed the recognition of the importance of applying counseling as part of the care process. Evidence has shown that using counseling contributes to the duration of continued exclusive breastfeeding [15, 16].

Accordingly, a study carried out in Bangladesh analyzed information from women who received breastfeeding counseling during the last trimester of pregnancy and six months after delivery, identifying that the implementation of a counseling program encourages and helps mothers to initiate breastfeeding during the first hour of life [17]. In turn, an investigation in Uganda that evaluated the impact of an intervention focused on applying breastfeeding counseling among peers in different socioeconomic strata, reported that exclusive breastfeeding was significantly concentrated in the poorest intervened group at 24 weeks postpartum, which shows that breastfeeding can be successfully promoted in the lowest socioeconomic groups [18], a situation like that reported in Soraca.

The impact evaluation identified that the intervened group had a greater number of meals during the three follow-ups, compared to the control group, findings that are close to the six mealtimes suggested by food-based dietary guidelines for pregnant women, breastfeeding mothers, and children less than two years of age for Colombia [19].

Likewise, the mothers who participated in 123 reported a higher level of knowledge regarding the benefits of breastfeeding. A study carried out at a maternal and child health center in Jordan investigated the results of childbirth preparation programs, finding that women increased their knowledge and understanding of aspects related to pregnancy, delivery, and postnatal periods, such for example, the benefits and duration of breastfeeding [20].

In a hospital in Athens, Greece, a quasi-experimental study was carried out to measure the effectiveness of a breastfeeding education program for pregnant women, which found that the women in the intervened group presented greater knowledge and self-efficacy of breastfeeding compared to the control group [21].

In Venezuela, an investigation developed at the Jorge Lizarraga Pediatric Hospital with lactating women who attended this institution concluded that the application of an educational program increased knowledge related to breastfeeding [22]. In this same country, an exploratory community study carried out on pregnant women who attended the prenatal consultation at the Patrocinio Peñuela Hospital showed that the majority of pregnant women received information on breastfeeding and wanted to breastfeed their child [23].

In Colombia, an investigation that inquired about the experience of exclusive breastfeeding for the mother in the first six months of her child's life with groups of mothers who receive education in programs of the Colombian Institute of Family Welfare who FAMI program in Spanish, Familia, Mujer e Infancia, reported that the mothers recognized the benefits for the baby and the emotional and affective benefits between mother and child [24].

Regarding the proportion of exclusive breastfeeding in 123, it was higher in the intervened group. A review that identified the effects of prenatal and postpartum educational interventions on the duration of exclusive breastfeeding found that according to one trial, an intervention combining prenatal education and postnatal support doubled the rate of exclusive breastfeeding compared to the control group who received only prenatal education [25].

In Hong Kong, an evaluation of the effectiveness of an educational intervention in breastfeeding identified that exclusive breastfeeding in the intervened group during the first six weeks postpartum was higher compared to the control group [26]. In Turkey, a prospective study aimed to investigate whether the addition of individual postnatal support to antenatal group counseling improved the prevalence of exclusive breastfeeding, finding that individual support targeted at weeks two and six weeks after delivery increased rates of breastfeeding at six months compared to prenatal education alone [27].

On the other hand, the proportion of bottle-fed children was higher in the control group than in the intervened group, which becomes a factor associated with abandoning the practice of breastfeeding. In Bucaramanga Colombia, a non-concurrent cohort study identified that one of the factors related to the abandonment of the practice of breastfeeding is the use of bottles [28]. In two hospitals in Mexico, a cross-sectional study also reported that one of the factors associated with the decrease in breastfeeding

is the use of a bottle [29]. In Peru, a cross-sectional investigation showed that 65.9% of the surveyed mothers considered it convenient to offer milk from a jar (n= 177) [30], which shows the need to implement prenatal education programs such as 123 to strengthen the practice of exclusive breastfeeding.

Regarding emotional health, it was identified that the intervened group recognized and managed two emotional changes during pregnancy. A quasi-experimental study in Anatolia Turkey concluded that compared to the control group, women who attended prenatal education had higher self-efficacy and less fear of childbirth [31].

On the other hand, 123 participants reported knowing the importance of breathing in pregnancy and childbirth. An investigation with women in Turkey determined the effect of breathing techniques on the perception of pain in women during labor and concluded that patient-directed support and education on non-pharmacological pain control methods, such as breathing techniques, were effective in reducing women's perception of pain [32]. In the same country, a randomized controlled trial was developed and determined that deep inhalation and exhalation breathing exercises in pregnant women are effective in reducing the perception of labor pain, in addition to reducing the duration of the second stage of labor [33].

Finally, the strategy 123 in Soraca was a clear example of how a prenatal educational intervention generates positive outcomes for mothers, infants, and their support networks in the areas of food and nutrition, emotional well-being, and physical health. Likewise, it establishes a framework of differential and effective care by the health center in a highly rural territory with limited resources, which positions prenatal health education as a mechanism that improves maternal and child health indicators.

Strengths and limitations

There are limitations of this research. Although, the size of the universe of the study group is small, an extension of the strategy in similar municipalities of Boyaca could contribute to more statistical power and thus further validate the results in which there is an orientation in favour of the intervention. However, it is important to clarify that to develop the intervention in other territories, a cultural adaptation of the strategy must be taken into account, since “En Soracá 123 por mi” responds to the cultural identity of the community.

Abbreviations

DANE: National Administrative Department of Statistics (Departamento Administrativo Nacional de Estadística)

UBN: Unsatisfied Basic Needs

IAMII: Baby Friendly Hospitals (Instituciones Amigas de la Mujer y la Infancia Integral)

FAMI: Family, Woman and Childhood (Familia, Mujer e Infancia)

Declarations

Ethics approval and consent to participate

The study complies with the definition in the Declaration of Helsinki regarding the development of research that involves human beings, and all legal representatives of the research subjects signed the informed consent forms acknowledging they understood what the participation of their pregnant in the study meant. The databases created for the study were anonymized for analysis, results and conclusions reporting. The study was authorized by the ethics committee of Fundación Santa Fe de Bogotá CCEI-2293-2014.

Consent for publication

Not applicable.

Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare they have no competing interests

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Authors' contributions

Through this, we declare that the six authors are responsible and guarantors that all the aspects that make up the manuscript have been reviewed and discussed with the maximum precision and integrity. In order of participation GA was the one who led the design and interpretation of data, construction, and final revision of the article. While PC, and NM, supported with the conception, construction, and final revision of the manuscript. Similarly, AC, ZF (Epidemiology consultant of the project), and AP supported information and final document revision.

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Figures

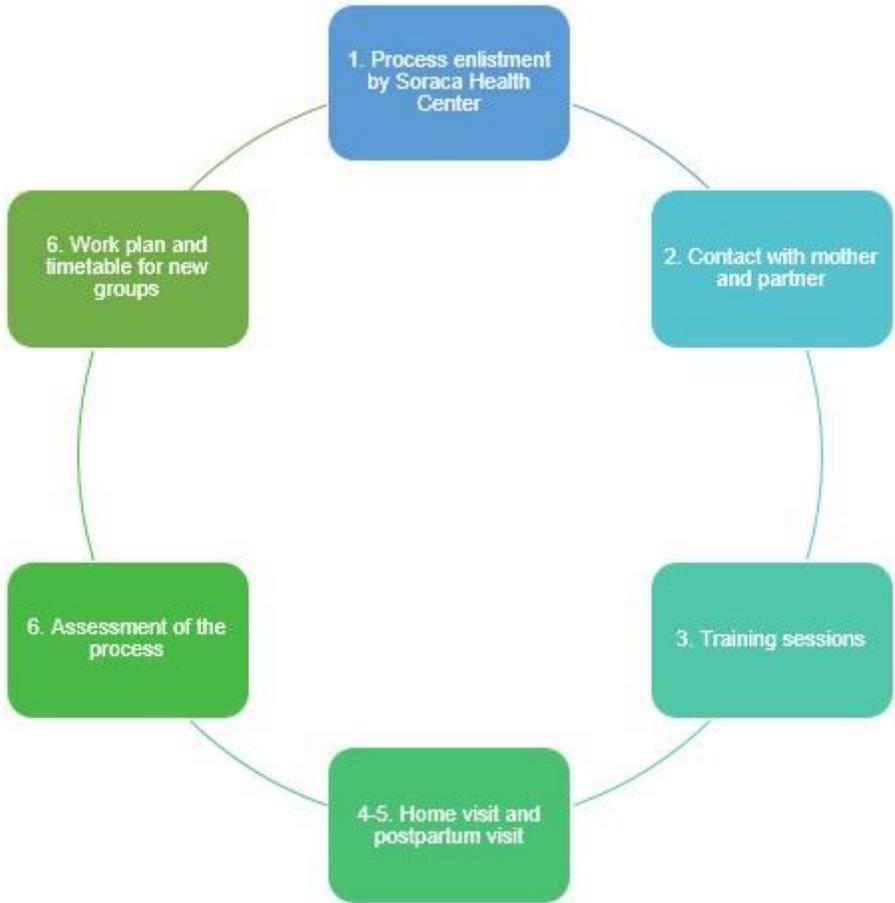


Figure 1

Steps of educational intervention

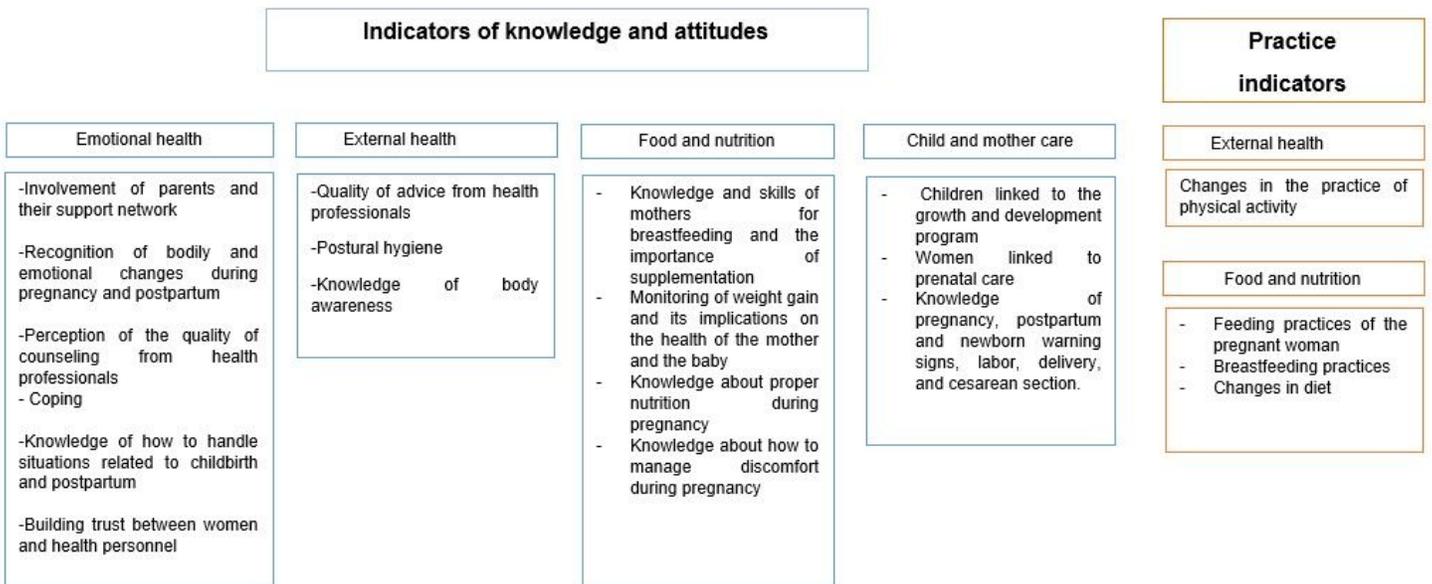


Figure 2

Indicators to measure results and impacts