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INNOVATIVE HOME VISITS AND MATERNAL AND CHILD HEALTH

Visitas domiciliares inovadoras e a saúde materno-infantil

Visitas domiciliarias innovadoras y la salud materno infantil

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ABSTRACT

Objective: To assess the effect of an Innovative Home Visits (IHV) program, which is based on an action-oriented guide, on mothers' knowledge and practices related to child health care, prenatal and postpartum care, and maternal and child health indicators (MCHI). **Methods:** Analytical cross-sectional study that compared 195 pregnant women and mothers who received IHV (group 1) with group 2, which received conventional home visits (CHV). The study was carried out in Family Health Care (FHC) centers in Recife, Pernambuco, between 2015 and 2016. 16 family health teams were divided into 2 groups: eight teams received training to perform IHV and eight did not receive training. There were ten IHV using the guide during pregnancy and the first nine months of the child's life. CHV occurred once a month in the same period IHV were carried out, but they did not use the guide. After nine months, the participants were interviewed using a questionnaire with contents related to maternal and child health. **Results:** 93 pregnant women (49 of group 1 and 44 of group 2) and 102 mothers (57 of group 1 and 45 of group 2) answered the questionnaire. The results showed better prenatal care indicators (p=0.005), better knowledge about contraceptive methods (p<0.001) and better indicators of exclusive breastfeeding and adequate complementary feeding (p<0.001) in group 1. **Conclusion:** The IHV program can contribute to improving MCHI and mothers' knowledge and practices related to child health care and pregnancy.

Descriptors: House Calls; Guideline; Maternal and Child Health; Community Health Workers.

RESUMO

Objetivo: *Avaliar o efeito de um programa de Visitas Domiciliares Inovadoras (VDI), que é baseado em um guia de orientação, nos conhecimentos e práticas de saúde das mães em relação aos cuidados da criança e durante os períodos pré/pós-natal, e indicadores de saúde materno-infantil (ISMI).* ***Métodos:*** *Estudo transversal e analítico que comparou 195 gestantes e mães que receberam VDI (grupo 1) com o grupo 2, de visitas domiciliares convencionais (VDC), realizado em Unidades de Saúde da Família (USF) de Recife, Pernambuco, entre 2015 a 2016. Dividiram-se 16 equipes de saúde da família em dois grupos: oito equipes receberam treinamento para VDI e oito não receberam. Houve dez VDI com a utilização do guia, durante a gestação e durante os nove meses da criança. As VDC ocorreram uma vez/mês, durante o mesmo período das VDI, mas sem o guia. Após nove meses, as participantes foram entrevistadas através de questionário com conteúdos relacionados à saúde materno-infantil.* ***Resultados:*** *93 gestantes (49 do grupo 1 e 44 do 2) e 102 mães de crianças (57 do grupo 1 e 45 do 2) responderam aos questionários. Os resultados mostraram melhores indicadores de pré-natal (p=0,005), melhor conhecimento sobre métodos contraceptivos (p<0,001) e melhores indicadores de amamentação exclusiva e de alimentação complementar adequada (p<0,001) no grupo 1.* ***Conclusão:*** *A VDI pode contribuir para melhorar os indicadores de saúde materno-infantil e os conhecimentos e as práticas de saúde das mães relacionados aos cuidados com as crianças e à gestação.*

Descritores: *Visita Domiciliar; Guia; Saúde Materno-Infantil; Agentes Comunitários de Saúde.*

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RESUMEN

Objetivo: *Evaluar el efecto de un programa de Visitas Domiciliarias Innovadoras (VDI) que está basado en una guía de orientación, en los conocimientos y las prácticas de salud de las madres con respecto a los cuidados del niño y durante los períodos pre/posnatal y los indicadores de salud materno infantil (ISMI).* ***Métodos:*** *Estudio transversal y analítico que ha comparado 195 embarazadas y madres que recibieron las VDI (grupo 1) con el grupo 2 de las visitas domiciliarias convencionales (VDC) realizado en las Unidades de Salud de la Familia (USF) de Recife, Pernambuco, entre 2015 y 2016. Se dividieron 16 equipos de salud de la familia en dos grupos: ocho equipos recibieron el entrenamiento para las VDI y ocho no. Hubo diez VDI con la utilización de la guía durante el embarazo y durante los nueve meses del niño. Las VDC se dieron una vez/mes durante el mismo periodo de las VDI pero sin la guía. Después de los nueve meses las participantes fueron entrevistadas a través de cuestionario con contenidos relacionados con la salud materno infantil.* ***Resultados:*** *93 embarazadas (49 del grupo 1 y 44 del grupo 2) y 102 madres de niños (57 del grupo 1 y 45 del grupo 2) contestaron los cuestionarios. Los resultados mostraron mejores indicadores de prenatal (p=0,005), mejor conocimiento sobre los métodos de contracepción (p<0,001) y mejores indicadores para el amamantamiento exclusivo y de alimentación complementaria adecuada (p<0,001) en el grupo 1.* ***Conclusión:*** *La VDI puede contribuir para la mejoría de los indicadores de la salud materno infantil y los conocimientos y las prácticas de salud de las madres relacionadas con los cuidados de los niños y el embarazo.*

Descriptores: *Visita Domiciliaria; Guía; Salud Materno-Infantil; Agentes Comunitarios de Salud.*

INTRODUCTION

Health promotion became a priority in the elaboration of health policies in Brazil in 1980. The Brazilian Government set the goal to reduce social and regional inequalities with the 1988 Constitution. The Unified Health System (*Sistema Único de Saúde – SUS*) guaranteed universal access to health and the Constitutional Reform, which created the SUS, transferred the responsibility for resources and for managing and evaluating the health services provided from the federal level to the municipal level[1].

With the objective of improving care for pregnant women and children and prioritizing continued health care, the government created, in 2011, the Stork Network, which is still active. Its activities focus on the health needs of women, including the care for pregnant and postpartum women and for the newborn. The network is also responsible for the follow-up of the child up to two years of age[2,3].

With regard to the eight Millennium Development Goals launched in 2000, Brazil reduced maternal mortality by only 43% by 2013 and failed to achieve the goal set for 2015, which consisted of a reduction of 75%; in addition, neonatal mortality remained high[4]. These situations demonstrated failures in the quality of care provided during pregnancy, childbirth and postpartum[5].

In order to promote health, it is important to consider the autonomy and uniqueness of individuals, collectivities and territories because an individual's living conditions are determined by the social, economic, political and cultural contexts in which they live[6].

With this objective, the National Health Promotion Policy (*Política Nacional de Promoção à Saúde – PNPS*) approved in 2006 aimed at overcoming the challenges in health production and continuous improvement of health practices and of the health system. In 2014, the PNPS was revised and recognized the need to join efforts with other public policies like the National Primary Health Care Policy (*Política Nacional de Atenção Básica – PNAB*), which sets the guidelines for the organization of the Primary Health Care component[7].

According to the PNAB, Primary Health Care is the preferential and introductory for of access to SUS[7]. Within Primary Health Care, actions are developed with a high degree of decentralization and are closely related to people's lives in addition to being focused on health promotion and disease prevention[8]. Women's and children's health care are included in the four components of the Stork Network: prenatal care; labor and delivery; postpartum and comprehensive child care; and logistic system[9].

The Family Health Strategy (*Estratégia de Saúde da Família – ESF*) was implemented to expand and improve Primary Health Care[10]. It is the starting point of care for pregnant women within the health system and it best suits their needs by providing longitudinal and continuous follow-up during pregnancy[11]. The ESF features the home visit (HV) as an important tool for the health care of the family. The HV enables health providers to access the family environment, thus favoring the acquisition of knowledge about the living conditions of the people, their environment, their habits, culture and socioeconomic conditions[12,13].

The systematic practice of HV is the main activity of the community health worker (CHW). However, in order to ensure adequate health care for the pregnant woman and the child, some difficulties need to be overcome: the lack of health promotion; the provision of home care; and the lack of specific theoretical and methodological training of CHW[14,15].

Studies have demonstrated that the lack of specific definitions of CHW function and their inadequate training are recognized as obstacles to the effective performance of HV to pregnant women and children[14,16]. Other factors that hinder the performance of HV include: dissatisfaction due to low pay; difficulties with user embracement and in bonding with some families; and excessive bureaucratic tasks, which result in a shortage of time to perform HV[17].

Thus, in order to contribute to the strengthening of health promotion policies and programs to provide better maternal and child health care and overcome some of the barriers

that impede the full implementation of health actions and strategies, this study aimed to assess the effects of an Innovative Home Visit (IHV) program on maternal and child health. The IHV are based on a guide that proposes to change the structure of HV to pregnant women, mothers and children. The guide takes into consideration mothers' knowledge and practices related to child health care and to pre- and postnatal care, and it also includes some maternal and child health indicators.

Given that, the present study aimed to assess the effect of an Innovative Home Visits (IHV) program, which is based on an action-oriented guide, on mothers' knowledge and practices related to child health care, prenatal and postpartum care, and maternal and child health indicators (MCHI).

METHODS

This is an analytical cross-sectional study carried out in 11 Family Health Care centers (*Unidades de Saúde da Família – USF*) in three Health Districts of Recife, Pernambuco, Brazil, with 16 family health care teams from October 2015 to October 2016. The USF selected for the study were comanaged by the Recife City Hall and the Community Extension Program of the Maternal and Child Institute of Pernambuco (*Programa de Extensão Comunitária do Instituto Materno Infantil de Pernambuco – PEC-IMIP*), which manage 12 primary health care centers that serve 10 low-income communities in the city of Recife. The 12 centers together have 18 family health care teams. It should be noted that one USF (with two teams) refused to participate in the study.

The study included pregnant women who were up to the third month of pregnancy and mothers of newborns who were served by the USF and had a permanent address in the community. Pregnant women who did not attend the first prenatal consultation scheduled in the first trimester of pregnancy and mothers of newborns who did not receive the home visit during the first week of the child's life or who did not attend the child care consultation were excluded.

The sample was calculated based on the number of pregnant women starting prenatal care and mothers of newborns starting the child care consultation per month in each USF during the year 2015. Since each family health care team served an average of 4 pregnant women and 3 mothers of newborns per month during that period, the study population would be composed of approximately 224 pregnant women and mothers of newborns served by the 16 family health care teams in 2 months. Considering a 95% level of reliability (z = 1.96), a margin of error (e) of 5%, and the expected difference proportion of 50%, the sample size was estimated to be 142 participants[18].

After approval by the Research Ethics Committee of the Maternal and Child Institute of Pernambuco (*Comitê de Ética e Pesquisa do Instituto Materno Infantil de Pernambuco – CEP-IMIP*), the Maternal and Child Health Institute of Pernambuco (*Instituto Materno Infantil de Pernambuco – IMIP*) and the Recife Municipal Health Secretariat (*Secretaria Municipal de Saúde – SMS*), the researchers visited all USF separately on different dates to explain the project to team members.

In the initial phase, the USF selected for the study presented similar characteristics related to service area, number of CHW in the family health care teams, number of families served by the center, operation of laboratories for tests, and availability of vaccines, medicines and contraceptive methods.

After that, 16 teams were randomly paired and divided into two groups for the performance of HV: a group with eight teams who received the training to perform the IHV and a group with eight teams who did not receive the training and continued to perform CHV. The training included guidelines for using the guide and implementing IHV and it was specifically delivered to the community health worker. There were 10 innovative visits in total: five during the 9 months of pregnancy and five during the child's first 9 months of life. Conventional visits were held once a month, totaling 18 visits: nine during the 9 months of pregnancy and nine during the child's first 9 months of life. They maintained the

habitual model already used by the CHW, which is characterized by the absence of previous or continuous training and of practical and structured material capable of orienting their main attributions during the visits.

In order to encourage the use of the guide, the researchers were supported by the nurses of the team of trained CHW, that is, the CHW who received information about the research objectives and the usefulness of the guide in meetings and in a 16-hour training.

The IHV Program consisted of the follow-up of pregnant women, mothers and children in a structured and systematic way through home visits guided by specific actions for each period of pregnancy and up to the child's 9 months of life. A guide containing information that should be used by the CHW and that was built based on national and international guidelines on maternal and child health guided the visits[19-21]. The guide provided information for a total of 10 home visits. It included information on the prenatal, postpartum, neonatal, and infant periods. The content addressed: the assessment of the maternal health status, the child and the family environment; the identification of socioeconomic and psychosocial problems and health risk factors; breastfeeding and complementary feeding information and encouragement; immunization; accident prevention; and practices conducive to child development and growth.

Prenatal visits included: 1st visit (1st trimester of pregnancy), 2nd and 3rd visits (2nd trimester of pregnancy), 4th and 5th visits (3rd trimester of pregnancy). Postpartum visits to mothers and children were divided into: 1st visit (1st week after discharge from maternity ward), 2nd visit (1st month of life of the child), 3rd visit (2nd-3rd month of life), 4th visit (5th-6th month of life) and 5th visit (8th-9th month of life).

At the end of each visit, the CHW should classify the pregnant woman, mother or child according to the health risk presented: emergency (red) – referral to the health are center or hospital; warning (yellow) – consultation in the health care center should be prioritized and scheduled; and prevention (green) – home visits should be kept on a regular basis.

After nine months, interviews were held with postpartum women/mothers (formerly pregnant) and mothers of 9-month-old children (previously mothers of newborns) who received 5 IHV and 9 CHV each.

The researchers constructed a specific questionnaire containing 96 questions to indirectly assess the knowledge and practices used by the mothers in group 1 and group 2. The interview allowed to compare the acquisition of knowledge and the improvement in the health practices between the mothers in group 1 and the mothers in group 2. In addition, it also allowed to assess the effectiveness of the use of the guide in the improvement of selected health indicators. The questionnaire was previously validated.

The questionnaire used with pregnant women included questions about: prenatal care coverage and quality indicators; family planning; protective and risk factors for pregnancy pathologies and fetal developmental; pregnant women's knowledge of good practices during childbirth; pregnant women's practices towards adequate fetal development; pregnant women's practices and knowledge related to contraceptive methods. The questionnaire used with the mothers of the children included questions on: child health indicators (immunization, breastfeeding and exclusive breastfeeding and complementary feeding) and appropriate practices (conversations, play and reading) or inappropriate practices (excessive use of TV and inappropriate punishment).

Data from the questionnaires were digitized, tabulated into a specific database and statistically analyzed using STATA/SE version 12.0. For the analysis of the feasibility and effects of the IHV program, the responses of the participants in group 1 were compared with the responses of the participants in group 2, and the results were described in tables as absolute and relative frequencies. The measures of central tendency and dispersion were used for numerical variables. There was an association between the chi-squared test and Fisher's exact test for the categorical variables. All tests were performed considering a 95% confidence interval.

This research complied with the requirements of Resolution 466/2012 of the National Health Council of the Ministry of Health regarding research on human beings and was approved by CEP-IMIP under Approval No. 970.358. The Recife Municipal Health Secretariat (*Secretaria Municipal de Saúde de Recife – SMS - Recife*) approved the research procedures after obtaining written authorization from the manager.

RESULTS

The study included 214 participants: 100 pregnant women and 114 mothers of children. In all, 93 of the eligible pregnant women answered the questionnaire for pregnant women: 49 in group 1 and 44 in group 2. As for mothers of children, 102 mothers answered the questionnaire: 57 in group 1 and 45 in group 2 (one participant of group 2 did not answer the questions used to collect epidemiological data, but she answered the other questions).

The mean age of the pregnant women was 25.12 years. The majority had completed primary education (51.61%, n=48) and had a monthly income of one minimum wage (39.78%, n=37). With regard to marital status, 48.39% (n=45) of the pregnant women reported being in a common-law marriage. As for planning and acceptance of pregnancy, 36.56% (n=34) of pregnant women reported planned pregnancy and 82.8% (n=77) reported good pregnancy acceptance (Table I).

Table I - Sociodemographic characteristics of pregnant women participating in the study. Recife, Pernambuco, 2016.

Characteristics	Total	Groups		p-value
		1 (IHV)	2 (CHV)	
Number of interviewees n (%)	**93 (100)**	**49 (52.69)[a]**	**44(47.31)[a]**	
Mean age (years)	**25.12**	**25.61**	**24.57**	**0.429[d]**
Education n (%)				
- Illiterate	2 (2.15)[a]	2 (4.08)[b]	0 (0.00)[c]	
- Complete primary education	48 (51.61)	24 (48.98)	24 (54.55)	
- Complete secondary education	37 (39.78)	23 (46.94)	14 (31.82)	
- Higher education	0 (0.00)	0 (0.00)	0 (0.00)	0.025[e]
- Graduate	0 (0.00)	0 (0.00)	0 (0.00)	
- Incomplete primary education	4 (4.30)	0 (0.00)	4 (9.09)	
- Incomplete secondary education	2 (2.15)	0 (0.00)	2 (4.55)	
Monthly income n (%)				
- Less than one minimum wage	35 (37.63)	18 (36.73)	17 (38.64)	
- One minimum wage	37 (39.78)	20 (40.82)	17 (38.64)	0.975[f]
- More than one minimum wage	21 (22.58)	11 (22.45)	10 (22.73)	
Marital status n (%)				
- Married	20 (21.51)	11 (22.45)	9 (20.45)	
- Common-law marriage	45 (48.39)	25 (51.02)	20 (45.45)	
- Single	28 (30.11)	13 (26.53)	15 (34.09)	0.729[f]
- Divorced	0 (0.00)	0 (0.00)	(0.00)	
Planned pregnancy n (%)	34 (36.56)	15 (30.61)	19 (43.18)	0.209[f]
Pregnancy acceptance n (%)	77 (82.80)	39 (79.59)	38 (86.36)	0.388[f]

[a]: percentage in relation to the total number of interviewees; [b]: percentage in relation to the total number of interviewees in group 1; [c]: percentage in relation to the total number of interviewees in group 2; [d]: t-test for equal means; [e]: Fisher's Exact test; [f]: Chi-squared test

The mean age of the mothers of the children was 26.69 years. Most of the students had completed primary education (56.44%, n=57) and 60.40% (n=61) of the mothers reported receiving a monthly income of one minimum wage. As for marital status, 49.50% (n=50) of the mothers reported being in a common-law marriage (Table II).

Table II - Sociodemographic characteristics of mothers of children participating in the study. Recife, Pernambuco, 2016.

Characteristics	Total	Groups		p-value
		1 (IHV)	2 (CHV)	
Number of interviewees n (%)	101*(100)	57 (56.44)a	44 (43.56)a	
Mean age (years)	26.69	27.25	25.93	0.441d
Education n (%)				
- Illiterate	0 (0.00)a	0 (0.00)b	0 (0.00)c	
- Complete primary education	57 (56.44)	41 (71.93)	16 (36.36)	
- Complete secondary education	33 (32.67)	13 (22.81)	20 (45.45)	
- Higher education	1 (0.99)	1 (1.75)	0 (0.00)	0.001e
- Graduate	0 (0.00)	0 (0.00)	0 (0.00)	
- Incomplete primary education	7 (6.93)	2 (3.51)	5 (11.36)	
- Incomplete secondary education	3 (2.97)	0 (0.00)	3 (6.82)	

Monthly income n (%)				
- Less than one minimum wage	23 (22.77)	14 (24.56)	9 (20.45)	0.869e
- One minimum wage	61 (60.40)	34 (59.65)	27 (61.36)	
- More than one minimum wage	17 (16.83)	9 (15.79)	8 (18.18)	
Marital status n (%)				
- Married	21 (20.79)	11 (19.30)	10 (22.73)	0.917e
- Common-law marriage	50 (49.50)	28 (49.12)	22 (50.00)	
- Single	28 (27.72)	17 (29.82)	11 (25.00)	
- Divorced	2 (1.98)	1 (1.75)	1 (2.27)	

a: percentage in relation to the total number of interviewees; b: percentage in relation to the total number of interviewees in group 1; c: percentage in relation to the total number of interviewees in group 2; d: t-test for equal means; e: Fisher's Exact test
* 102 mothers were interviewed, but 1 did not answer the sociodemographic questions

There was a significant difference in education (p=0.025) between pregnant women in group 1 and pregnant women in group 2. However, most of the participants in group 1 (48.98%, n=24) and in group 2 (54.55%, n=24) reported having completed primary education. There was also a significant difference (p=0.001) in education between group 1 and group 2 of mothers of children. Most of the mothers in group 1 (71.93%, n=41) had completed primary education and most of the mothers in group 2 (45.45%, n=20) had completed secondary education.

The statistical analysis of the influence of education on the answers given by the participants in each group (groups 1 and 2 of pregnant women and mothers) was carried out separately. For pregnant women, education may have influenced the results related to prenatal care routine. Education did not influence the other indicators analyzed. In addition, the mothers who received IHV presented lower levels of education compared with the mothers who received IHV (Table III).

Table III - Influence of education on maternal and child health indicators results. Recife, Pernambuco, 2016.

	Education			***p-value***
	Total	**Low***	**High***	
Indicators	**n (%)**	**n (%)**	**n (%)**	
Gestantes - grupo 1 (VDI)				
Adequate prenatal care routine	42 (85.7)[a]	19 (45.2)[b]	23 (54.8)[b]	0.011[d]
Adequate pregnancy habits	44 (89.8)[a]	21 (47.7)[b]	23 (52.3)[b]	0.052[e]
Pregnant women's adequate knowledge about good childbirth practices	24 (49.0)[a]	11 (45.8)[b]	13 (54.2)[b]	0.321[e]
Adequate practices to stimulate fetal development during prenatal	40 (81.6)[a]	20 (50.0)[b]	20 (50.0)[b]	0.472[e]
Mothers' adequate practices and knowledge related to contraceptive methods	27 (67.5)[a]	12 (44.4)[b]	15 (55.6)[b]	0.311[e]
Pregnant women - group 2 (CHV)				
Adequate prenatal care routine	26 (59.1)[a]	20 (76.9)[b]	6 (23.1)[b]	0.028[e]
Adequate pregnancy habits	41 (95.3)[a]	27 (65.9)[b]	14 (34.1)[b]	1.000[d]
Pregnant women's adequate knowledge about good childbirth practices	16 (38.1)[a]	10 (62,5)[b]	6 (37.5)[b]	0.850[e]
Adequate practices to stimulate fetal development during prenatal	36 (83.7)[a]	24 (66.7)[b]	12 (33.3)[b]	0.680[e]
Mothers' adequate practices and knowledge related to contraceptive methods	10 (22.7)[a]	6 (21.4)[b]	4 (25.0)[b]	1.000[e]
Mothers of children - group 1 (IHV)				
Better child health indicators	40 (70.2)[a]	31 (77.5)[b]	9 (22.5)[b]	0.738[d]
Adequate practices to stimulate child development	31 (55.4)[a]	20 (64.5)[b]	11 (35.5)[b]	0.044[e]
Practices that hinder child development	35 (62.5)[a]	25 (71.4)[b]	10 (28.6)[b]	0.426[e]
Mothers of children - group 2 (CHV)				
Better child health indicators	13 (29.5)[a]	6 (46.2)[b]	7 (53.8)[b]	0.892[e]
Adequate practices to stimulate child development	21 (50.0)[a]	8 (38.1)[b]	13 (61.9)[b]	0.352[e]
Practices that hinder child development	31 (75.6)[a]	12 (38.7)[b]	19 (61.3)[b]	0.144[e]

[a] : percentage in relation to the total number of interviewees; [b]: percentage in relation to the total number of interviewees for the corresponding assessed indicator described in the table; [d]: Fisher's Exact test; [e]: Chi-squared test

The prenatal care routine was adequate for 85.71% (n=42) of the pregnant women in group 1 and 59.09% (n=26) of the pregnant women in group 2 (p=0.005). Of the pregnant women in group 1, 79.17% (n=38) received six or more prenatal consultations; 100% (n=16) received an adequate follow-up of intercurrences; 87.76% (n=43) performed all the tests requested and received the results; 72.34% (n=34) achieved adequate weight gain during pregnancy and 81.63% (n=40) had their immunization scheduled updated (Table IV). In group 2, 36.84% (n=14) of the pregnant women received six or more prenatal visits; 76.92% (n=10) received an adequate follow-up of the intercurrences; 79.55% (n=35) performed all the tests requested and received the results; 69.44% (n=25) achieved adequate weight gain during pregnancy and 69.77% (n=30) had their immunization schedule updated (Table IV).

With regard to the habits of pregnant women, 63.27% (n=31) of the participants in group 1 and 79.07% (n=34) of the participants in group 2 reported having healthy habits (p=0.100). In all, 48.98% (n=24) of the pregnant women in group 1 and 38.10% (n=16) of the pregnant women in group 2 (p=0.298) had adequate knowledge about good childbirth practices. As for fetal development stimulation practices, 81.60% (n=40) of the participants in group 1 and 83.70% (n=36) of the participants in group 2 (p=0.792) reported carrying out activities that stimulated fetal development. There was no significant difference between groups 1 and 2 for the items related to healthy habits, knowledge about good childbirth practices, and fetal development stimulation practices (Table IV).

The knowledge and practices related to contraceptive methods were considered sufficient in 67.50% (n=27) of the pregnant women in group 1 and in 22.73% of the pregnant women in group 2 (n=10) (p<0.001). It should be noted that knowledge about IUD as a contraceptive method was reported by 40% (n=16) of the participants in group 1 and by 0% of the participants in group 2 (p<0.001) (Table IV).

Table IV - Indicators of prenatal care routine, knowledge, habits and practices among pregnant women who received innovative or conventional home visits. Recife, Pernambuco, 2016.

Indicators	Total	Groups		*p-value*[d]
		1 (IHV)	2 (CHV)	
	n (%)	n (%)	n (%)	
Total number of responses	93 (100)	49 (52.69)[a]	44 (47.31)[a]	**0.005**
Adequate prenatal care routine	68 (73.12)[a]	42 (85.71)[b]	26 (59.09)[c]	
- Total number of interviewees	86 (100)	48 (55.81)	38 (44.19)	**<0.001**
- Number of prenatal consultations (>/= 6 consultations)	52 (60.47)	38 (79.17)	14 (36.84)	
- Total number of interviewees	29 (100)*	16 (55.17)	13 (44.83)	0.078
- Adequate follow-up of intercurrences during pregnancy	26 (89.65)	16 (100)	10 (76.92)	
- Total number of interviewees	93 (100)	49 (52.69)	44 (47.31)	0.282
- Performed the laboratory tests requested	78 (83.87)	43 (87.76)	35 (79.55)	
- Total number of interviewees	83 (100)	47 (56.63)	36 (43.37)	0.811
- Adequate weight gain	59 (71.08)	34 (72.34)	25 (69.44)	
- Total number of interviewees	92 (100)	49 (53.26)	43 (46.74)	0.183
- Adequate immunization during pregnancy	70 (76.09)	40 (81.63)	30 (69.77)	
Total number of responses	92 (100)	49 (53.26)[a]	43 (46.74)[a]	0.100
Adequate pregnancy habits	65 (70.65)[a]	31 (63.27)[b]	34 (79.07)[c]	
- Total number of interviewees	92 (100)	49 (53.26)	43 (46.74)	0.277
- Physical exercise during pregnancy	21 (22.83)	9 (18.37)	12 (27.91)	
- Total number of interviewees	21 (100)**	9 (42.86)	12 (57.14)	0.104
- Adequate types of physical exercises	17 (80.95)	9 (100)	8 (66.67)	
- Total number of interviewees	91 (100)	49 (53.85)	42 (46.15)	0.183
- 8-hour sleep	63 (69.23)	31 (63.27)	32 (76.19)	
- Number of interviewees	92 (100)	49 (53.26)	43 (46.74)	0.719
- Smoking	8 (8.70)	5 (10.20)	3 (6.98)	
- Number of interviewees	92 (100)	49 (53.26)	43 (46.74)	1.000
- Drinking	10 (10.87)	5 (10.20)	5 (11.63)	
- Number of interviewees	92 (100)	49 (53.26)	43 (46.74)	0.497
- Illicit drug use	2 (2.17)	2 (4.08)	0 (0.00)	
- Number of interviewees	85 (100)	46 (54.12)	39 (45.88)	0.530
- Read and understood the pregnancy guide	38 (44.71)	22 (47.83)	16 (41.03)	
- Number of interviewees	89 (100)	48 (53.93)	41 (46.07)	0.683
- Adequate adherence to prescribed medications	83 (93.26)	44 (91.67)	39 (95.12)	

Total number of responses	91 (100)	49 (53.85)[a]	42 (46.15)[a]	0.298
Pregnant women's adequate knowledge about good childbirth practices	40 (43.96)[a]	24 (48.98)[b]	16 (38.10)[c]	
- Total number of interviewees	91 (100)	49 (53.85)	42 (46.15)	0.244
- Knew the positions that favored normal delivery	45 (49.45)	27 (55.10)	18 (42.86)	
- Total number of interviewees	90 (100)	49 (54.44)	41 (45.56)	0.217
- Knew the advantages of normal delivery	65 (72.22)	38 (77.55)	27 (65.85)	
Total number of responses	92 (100)	49(53.30%)	43 (46.70%)	0.729
Adequate practices to stimulate fetal development during prenatal	76(82.60%)	40 (81.60%)	36 (83.70%)	
- Total number of interviewees	92 (100)	49 (53.26)	43 (46.74)	0.792
- Talked to the child during pregnancy	76 (82.61)	40 (81.63)	36 (83.72)	
- Total number of interviewees	91 (100)	49 (53.85)	42 (46.15)	0.738
- Read to the child during pregnancy	12 (13.19)	7 (14.29)	5 (11.90)	
- Total number of interviewees	92 (100)	49 (53.26)	43 (46.74)	1.000
- Rubbed the belly during pregnancy	87 (94.57)	46 (93.88)	41 (95.35)	
Total number of responses	84 (100)	40 (47.62)[a]	44 (52.38)[a]	**< 0.001**
Mothers' adequate practices and knowledge related to contraceptive methods	37 (44.05)[a]	27 (67.50)[b]	10 (22.73)[c]	
- Total number of interviewees	84 (100)	40 (47.62)	44 (52.38)	1.000
- Knew at least one type of contraceptive method	82 (97.62)	39 (97.50)	43 (97.73)	
- Total number of interviewees	84 (100)	40 (47.62)	44 (52.38)	**<0.001**
- Knew the IUD was a contraceptive method	16 (19.05)	16 (40.00)	0 (0.00)	
- Total number of interviewees	82 (100)	40 (48.78)	42 (51.22)	0.532
- Used some type of contraceptive method before pregnancy	56 (68.29)	26 (65)	30 (71.43)	
- Number of interviewees	58 (100)	28 (48.28)	30 (51.72)	0.464
- Correct knowledge about the number of days to start using a contraceptive method	8 (13.79)	5 (17.86)	3 (10)	
- Number of interviewees	73 (100)	40 (54.79)	33 (45.21)	1.000
- Believed breastfeeding prevented pregnancy	8 (10.96)	4 (10.00)	4 (12.12)	
- Number of interviewees	68 (100)	38 (55.90)	30 (44.1)	0.062
- Partner supported the method used by the woman	63 (92.60)	33 (86.80)	30 (100)	
- Number of interviewees	48 (100)	19 (39.58)	29 (60.41)	0.058
- Partner supported the use of male condom	13 (27.10)	8 (42.10)	5 (17.24)	

[a]: percentage in relation to the total number of interviewees; [b]: percentage in relation to the total number of interviewees in group 1; [c] = percentage in relation to the total number of interviewees in group 2; [d]: Chi-squared test. *Total number of patients who presented intercurrences during pregnancy.**Total number of patients who did physical exercises; IUD: intrauterine device

The mothers of the children in group 1 showed better indicators of child health in relation to group 2 (p<0.001). The indicators analyzed included: vaccination coverage; exclusive breastfeeding duration (4 to 6 months); adequate age of initiation and interval of complementary feeding, and types of food offered. In group 1, 61.40% (n=35) of the participants presented exclusive breastfeeding duration of 4 to 6 months, 64.91% (n=37) started complementary feeding at the right age of the child, 81.82% (n=45) offered food at a recommended interval of time and 53.57% (n=30) offered adequate food to the children. The rates found in group 2 were, respectively, 22.22% (n=10), 23.26% (n=10), 55.81% (n=24) and 11.36% (n=5) (Table V).

In all, 55.36% (n=31) of the mothers in group 1 and 51.16% (n=22) of the mothers in group 2 (p=0.687) carried out activities that stimulated infant development. There was no significant difference regarding the activities (Table IV). Although there was no significant difference in reading, 33.93% (n=19) of the mothers in group 1 reported reading to their children on a weekly basis compared with 19.05% (n=8) of the mothers in group 2 (Table V).

A total of 37.50% (n=31) of the mothers in group 1 and 23.81% (n=22) of the mothers in group 2 (p=0.152) reported practices that may compromise infant development. There was no significant difference between the number of hours the child spent in front of the television (3 hours a day or more) and the use of inappropriate punishments (physical violence and verbal aggression) (Table V).

Table V - Indicators of child health and practices to stimulate child development among mothers who received innovative or conventional home visits. Recife, Pernambuco, 2016.

Indicators	Total	Groups		*p-value*[d]
		1 (IHV)	2 (CHV)	
	n (%)	n (%)	n (%)	
Total number of responses	102 (100)	57 (55.88)[a]	45 (44.12)[a]	**< 0.001**
Better child health indicators	53 (51.96)[a]	40 (70.18)[b]	13 (28.89)[c]	
- Total number of interviewees	100 (100)	57 (57)	43 (43)	0.074
- Adequate vaccine coverage	91 (91)	49 (85.96)	42 (97.67)	
- Total number of interviewees	102 (100)	57 (55.88)	45 (44.12)	**0.018**
- Adequate duration of exclusive breastfeeding	45 (44.12)	35 (61.40)	10 (22.22)	
- Total number of interviewees	100 (100)	57 (57)	43 (43)	**<0.001**
- Initiation of complementary feeding at 4 or 6 months	47 (47)	37 (64.91)	10 (23.26)	
- Total number of interviewees	98 (100)	55 (56.12)	43 (43.88)	**0.005**
- Adequate interval between complementary feeds (every 3 hours)	69 (70.41)	45 (81.82)	24 (55.81)	
- Number of interviewees	100 (100)	56 (56)[a]	44 (44)[a]	**<0.001**
- Adequate types of food offered	35 (35)[a]	30 (53.57)[b]	5 (11.36)[c]	
Total number of responses	99 (100)	56 (56.57)[a]	43 (43.43)[a]	0.687
Adequate practices to stimulate child development	53 (53.54)[a]	31 (55.36)[b]	22 (51.16)[c]	
- Total number of interviewees	99 (100)	56 (56.57)	43 (43.43)	0.434
- Talked to the child	98 (98.99)	56 (100)	42 (97.67)	
- Total number of interviewees	99 (100)	56 (56.57)	43 (43.43)	0.434
- Plays with the child	98 (98.99)	56 (100)	42 (97.67)	
- Total number of interviewees	99 (100)	56 (56.57)	43 (43.43)	0.278
- Tells stories to the child	40 (40.40)	20 (35.71)	20 (46.51)	
- Number of interviewees	98 (100)	56 (57.14)	42 (42.86)	0.247
- Listens to music	86 (87.76)	51 (91.07)	35 (83.33)	
- Number of interviewees	98 (100)	56 (57.14)	42 (42.86)	0.103
- Weekly reading	27 (27.55)	19 (33.93)	8 (19.05)	
- Number of interviewees	97 (100)	56 (57.73)	41 (42.27)	0.605
- Children's books in the house	55 (56.70)	33 (58.93)	22 (53.66)	
- Number of interviewees	95 (100)	56 (58.95)	39 (41.05)	0.826
- Age of children's first contact with books (from 6 months)	50 (52.63)	30 (53.57)	20 (51.28)	
Total number of responses	98(100)	56 (57.14)[a]	42 (42.86)[a]	0.152
Practices that hindered child development	31 (31.63)[a]	21 (37.50)[b]	10 (23.81)[c]	
- Total number of interviewees	98 (100)	56 (57.14)	42 (42.86)	0.204
- Number of hours spent watching TV (more than 3 hours)	25 (25.51)	17 (30.36)	8 (19.05)	
- Total number of interviewees	98 (100)	56 (57.14)	42 (42.86)	0.753
- Inappropriate punishment	11 (11.22)	7 (12.50)	4 (9.52)	

[a:] percentage in relation to the total number of interviewees; [b:] percentage in relation to the total number of interviewees in group 1; [c:] percentage in relation to the total number of interviewees in group 2; [d:] Chi-squared test

DISCUSSION

The present study showed that a IHV program based on an action-oriented guide can contribute to improving maternal and child health indicators. There was a statistically significant difference between groups 1 and 2 in prenatal care routine indicators, in knowledge and practices related to contraceptive methods, and in child health indicators analyzed in relation to feeding. However, there were no significant differences between the other variables studied.

There was a significant difference in the level of education between the pregnant women in groups 1 and 2 in the present study. This difference may have interfered in the results of indicators related to the prenatal care routine, but it has not been shown to have influenced the results related to better knowledge about the use of contraceptive methods. It should be noted that prenatal care routine indicators are not data related to the participants' knowledge. The level of education was also significantly different between group 1 and group 2 of mothers of children. However, the statistical analysis of the group showed that better indicators of child health presented by group 1 were no

influenced by education. In addition, mothers in group 1 presented lower levels of education and better results, as previously mentioned, thus demonstrating that these results may have been caused by the IHV program.

Research on CHW have pointed out factors that may have influenced the other results obtained with IHV. Some of these factors include: people were not at home on the day scheduled for the visit, difficult access, and exposure to local violence[17]. The excessive number of tasks was a condition that limited professionals' performance of home care, community and health education activities[22].

In a qualitative study conducted by the researchers of the present study with focus groups of CHW and other health care team members, some barriers to the implementation of IHV were reported: difficulties working based on the content of the guide, lack of financial support, poor support from the family health care team, and, mainly, the lack of support from district authorities for the systematic use of the guiding material. It should be noted that there was no report of any negative experience resulting from IHV in the relationship between CHW and the community[23].

The positive results of the present research showed that IHV may have contributed to improving prenatal care of pregnant women, not only with regard to the minimum number of prenatal consultations, but also in relation to laboratory tests performed and adequate follow-up of the complications during prenatal care.

One of the strategies of the National Policy for Comprehensive Child Health Care (*Política Nacional de Atenção Integral à Saúde da Criança – PNAISC*) is the provision of humanized and quality care during pregnancy, labor and childbirth and to the newborn, including prenatal care activities and follow-up of children in primary care[24]. To reduce maternal and infant mortality, it is important to ensure easy access to quality health services and compliance with protocols based on the best scientific evidence[24]. The IHV program based on an action-oriented guide favored compliance with protocols already established by the Ministry of Health in primary care, thus offering a high-quality prenatal care.

The Stork Network, which is considered the most complete program ever developed by the Federal Government, ensures the right to reproductive planning for women through the provision of guidance on body care and use of contraceptive methods[9]. Another significant finding of the present study was related to pregnant women's knowledge about the function of the intrauterine device (IUD). The number of women who knew and was interested in using IUD was higher in group 1. Therefore, the IHV contributed to explaining the importance of the use of a contraceptive method that is delivered by SUS, thus favoring reproductive planning, which is one of the strategies of the Stork Network.

With regard to child health, the introduction of complementary feeding still appears as a problem when considering the moment of initiation of complementary feeding and the types of food introduced[25].

The Brazilian Breastfeeding Strategy (*Estratégia Amamenta Brasil – EAB*), which was created through the integration between the Brazilian Breastfeeding Network and the National Strategy for the Promotion of Healthy Complementary Feeding, aims to improve breastfeeding promotion and healthy complementary feeding practices for children under 2 years of age. In addition, it seeks to improve competencies and skills of health professionals working in Primary Health Care centers (UBS) to promote breastfeeding and adequate complementary feeding by including these actions in routine activities[26].

The findings of the present study showed significant improvements in exclusive breastfeeding duration, initiation of complementary feeding, and types and consistency of the foods offered to children by the mothers in group 1, thus demonstrating a beneficial effect of the IHV on one factor of great importance for children's health. In agreement with the objectives of the EAB, the IHV were able to promote breastfeeding and healthy complementary feeding through the use of guidelines, which took into account the cultural, social and economic aspects of the women participating in the study.

All the positive results of the present study are in line with other research findings that recommend the use of educational materials, guidelines and educational interventions in health services as technically reliable sources to ensure adequate maternal and child health conditions and to improve the use of contraceptive methods, exclusive breastfeeding and the quality of children's complementary feeding[27-36].

The present study presented an innovation with the implementation of an IHV program based on an action-oriented guide. In Brazil, the main material that guides the work of CHW in maternal and child health is the Practical Guide for the Community Health Worker. However, CHW do not receive training for the use of the guide and it is not structured according to the important themes that should be addressed in each home visit[37]. The guide offered a sequence of aspects that should be observed, informed, encouraged, identified and questioned and that directed visit of the CHW in an objectively manner. In addition, the training provided enabled CHW to use the material. Considering that one of the main difficulties pointed out by the CHW was the excessive number of activities, the IHV program reduced the number of HV made by the CHW[17].

The researchers acknowledge that the study had a limited number of participants and that the assessment of the practices was performed indirectly with the application of the questionnaire. However, some actions to improve the effectiveness of the use of the guide should be considered in order to obtain better results in maternal and child health. Such actions include: structuring its contents in order to make it a handbook; incorporating the observed data with its applicability to patients' medical records; supporting and ensuring the supervision of the use of the guide by the whole health care team; and, mainly, obtaining support from the municipal, state and federal health authorities to implement the IHV program.

CONCLUSION

The Innovative Home Visit program based on an action-orientation guide contributed to improving mothers' knowledge about child health care during the pre- and postnatal periods, thus favoring the improvement of maternal and child health indicators.

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CONFLICTS OF INTEREST

The authors declare there are no conflicts of interest.

CONTRIBUTIONS

Paula Ferdinanda contributed to planning, data collection, literature review, elaboration of the guide, drafting the manuscript and manuscript submission. **Tereza Rebecca** and **Francesca Vezzini** contributed to research planning, data collection, elaboration of the guide and revision of the manuscript. **Giorgio Tamburlini** contributed to planning, elaboration of the guide, drafting and revision of the manuscript.

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