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# The Ife South Breastfeeding Project: training community health extension workers to promote and manage breastfeeding in rural communities

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*Reported are the results of a project to promote exclusive breastfeeding in rural communities through the training of community health extension workers in rural Nigeria. A workshop for the trainers was organized for health workers in the study area; subsequently, these trainers ran district-level training workshops.*

*In the study area perinatal facilities, early initiation of breastfeeding has increased compared with those in the control area ( $P < 0.001$ ). Also, the trained health workers had significantly better knowledge about breastfeeding than their untrained colleagues in both the study ( $P < 0.001$ ) and control areas ( $P < 0.001$ ), and more often recommended timely initiation and exclusive breastfeeding than the controls ( $P < 0.001$ ). A multivariate analysis showed that the training programme and the study area were the only significant variables that were predictors of breastfeeding knowledge ( $P < 0.001$ ). Appropriate education of health extension workers can therefore contribute significantly to the promotion of breastfeeding in rural communities.*

## Introduction

The many nutritional, immunological, and contraceptive advantages of breast milk and breastfeeding have been well documented (1, 2). Breastfeeding is also being promoted for the prevention of diarrhoeal diseases (3), which claim the lives of over 300 000 Nigerian children annually (4, 5).

Although almost all Nigerian women breast-feed, there has been a decline in the duration of breastfeeding and less than 2% practice exclusive breastfeeding for the first 4 months (6). Also, initiation of breastfeeding is often delayed and many cultural perceptions and factors militate against effective breastfeeding practices in rural communities (7).

There is a need to promote, protect, and support breastfeeding as a child survival strategy (8) in rural communities in Nigeria. Reported here are results that were obtained as part of a larger study to promote breastfeeding. This article describes the promotion programme, which included community education and the training of community health ex-

tension workers in breastfeeding and lactation management, and evaluates its impact on breastfeeding knowledge and practice. Training of health workers makes an important contribution to breastfeeding promotion (8–10); however, while there is ample evidence that such training can improve hospital practices, few reports have appeared on the effects of training extension health workers at the primary health care level in underserved rural communities.

## Methods

### *Location of study*

The study was conducted in Ife South local government (ISLG) area, Osun State, Nigeria, as part of the Ife South Breastfeeding Project (ISBFP), a community-based promotion programme. ISLG is a predominantly rural area with an estimated population of 88 900 persons who live in about 450 villages and smaller settlements, most of which are Yoruba farming communities. The largest of the villages are Ifetedo, the administrative headquarters of the local government, and Olode, each with a population of about 3000. Sanitation is generally poor. Only these two villages have electricity and piped water. Water for domestic use is drawn from shallow wells and streams.

The study area consists of ten health districts, with a total of 30 health facilities: rural health cen-

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tres, maternity centres, and health posts. In addition, there is a primary health care (PHC) centre at Ifetedo. These health facilities are staffed by mid-level and lower primary health care workers: community health extension workers, traditional birth attendants, and nurses. Village volunteer health workers are also active at the community level. There is one doctor at the primary health care facility at Ifetedo, but none at any of the local government health facilities. Perinatal care is offered mainly by the PHC workers and traditional birth attendants.

There are no secondary or tertiary health care centres in the study area, and Obafemi Awolowo University Teaching Hospital (OAUTH), where there is a baby-friendly hospital initiative programme, is 45 km from it.

Many of the health districts have health committees. Ife South health department, including its 30 health facilities, has 103 health workers, eight of whom are trained nurses; 18 of the PHC workers were absent on various courses during the training component of the breastfeeding project.

Atakmosa local government (ATLG) area served as the control area; no training activities were conducted there, and it is contiguous with the study area and similar to it. The control area has a population of 99200 living in about 200 small villages, with the predominant occupations being farming and petty trading; its health department has 86 PHC workers in 14 health districts.

### **Focus group discussions**

Focus group discussions, using a discussion guide on breastfeeding issues, were conducted among a group of 8–10 PHC workers in each of the study and control areas. The discussions were supplemented with in-depth interviews of two PHC workers in each area. These interviews were carried out prior to the training activities, and the results obtained contributed to planning the training activities.

### **Training workshops and programmes**

A one-day community mobilization workshop was held at Olode that was attended by traditional leaders, local government officials, community health workers, and mothers. The workshop was designed as a 6-hour introductory course on breastfeeding and child survival. It was conducted in Yoruba, the local language, and the following topics were included: anatomy and physiology of the breast; exclusive breastfeeding; expressed breast milk; lactation maintenance; and practical demonstrations of attachment, suckling, expression of breast milk, and cup feeding.

An intensive 2-day course for the workshop trainers was held in Ifetedo for health workers from each of the 10 health districts. Other participants included local government officials. The course consisted of 12 hours of instruction (including 3 hours of clinical practice). Its content had been adapted from the WHO/UNICEF 18-hour breastfeeding course manual (11), appropriately modified to suit nonhospital-based primary care and rural settings, and included lectures, demonstrations, practicals, as well as role-playing and case studies. The resource persons were master trainers from the OAUTH baby-friendly hospitals initiative programme. The workshop was also conducted in Yoruba. A total of 30 PHC workers from ISLG underwent training at this workshop.

Training workshops were also held after the trainers' course in each of the 10 health districts. Prior to these, meetings were held in all the districts with health workers, nursing mothers, and community leaders, at which the advantages of breastfeeding and its importance for child survival were discussed. Each health district was encouraged to form community breastfeeding support groups. These meetings also planned the district level training workshops, whose participants, apart from PHC workers, included mothers, husbands, and community leaders. The district-level workshops consisted of 6 hours of instructions and 2 hours of demonstrations and practicals (scaled-down versions of the trainers' course); they were also conducted in Yoruba and the resource persons were PHC workers who had attended the trainers' course. A further 36 PHC workers and 569 community members received training at these district-level workshops.

### **Study samples**

A pre-tested, self-administered questionnaire focusing on key issues — when breastfeeding is initiated, prelacteal feeding, exclusive breastfeeding, colostrum, and the advantages of breastfeeding — was sent to all eligible PHC workers in the study area, and to the 56 PHC workers in 7 of the 14 health districts in the control area selected at random. The questionnaire study was conducted 4 months after the last of the training workshops. Sample size was calculated assuming that 40% of untrained health workers had acceptable breastfeeding knowledge scores, and that training would double this proportion. To achieve a power of detection of 95% and a 5% significance level, 42 respondents were needed from each of the control and study areas (12).

Another questionnaire study was also conducted among the women who had been recruited

from three health districts in each of the areas, chosen by convenience, into the ISBFP in their last trimester of pregnancy (7). This post-delivery questionnaire included assessments of who delivered them and where, when breastfeeding was initiated, the use of prelacteal feeds, and other breastfeeding issues. Of the 126 women in the intervention area and the 130 in the control area, 98 and 108 women, respectively, completed the questionnaire.

### Data analysis

Statistical analysis was performed by calculating means, standard error of the mean, 95% confidence intervals,  $\chi^2$  tests, and stepwise, multiple linear regression using EPI-Info software (13). Multiple logistic regression analyses were performed using LOGISTIC version 3.03e software (14).

The questionnaire variables were defined as follows: *bfinit*, knowledge of early initiation (within 30 min of delivery) of breastfeeding; *aprelact*, knowledge about not using prelacteal feeds; *bffull*, knowledge that the breastfeeding baby does not need supplementary water; *bfclusv*, response that exclusive breastfeeding, without supplementary water, should be practised for the first 4–6 months; *hwcolstr*, *advchild*, *advmothr*, ability to provide at least two valid advantages of feeding colostrum, breastfeeding to the infant, and breastfeeding to the mother, respectively.

## Results

The age, sex, and marital status of the PHC workers are shown in Table 1.

Table 1: Selected sociodemographic characteristics of primary health care workers in the study (ISLG) and control areas (ATLG)

Characteristic	ISLG area			ATLG area
	ISBFP trained	Others	Total	
<i>Age group</i>				
<20 years	3	1	4	1
20–29 years	18	4	22	25
30–39 years	22	7	29	21
≥40 years	23	2	25	4
Total	66	14	80	52
Males	17	5	22	2
<i>Marital status</i>				
Single	12	3	15	15
Married	51	11	62	35
Separated/widowed	1	—	1	1
Unspecified	—	—	—	1

### Focus group discussions

The results of pre-training focus group discussions among groups of PHC workers in the control and study areas were the same. The health workers were aware that mothers in their communities did not feed colostrum to their babies because they perceived it as dirty (“like pus”) and capable of transmitting disease; however, they encouraged mothers to feed colostrum because it is good, “makes the baby grow and develop immunity”, and “deepens love between mother and child”. The health workers also held that for mothers “who lactate immediately”, breastfeeding should commence 6 hours after birth or at the latest within the first day following delivery. The delay was stated to be necessary since “babies are unable to suck immediately after birth because they are tired”. Mothers who were not able to lactate immediately, could take up to 2 days to commence breastfeeding.

The opinions of the health workers on prelacteal feeds were divided. Most of them advocated giving clean water; some thought that the baby could wait for breast milk; most agreed, however, that it was not possible to breastfeed without giving supplementary water, because “the baby will become thirsty”. Some of the health workers also stated that it was necessary to give other supplements because “today’s babies cannot be fully satisfied with breast milk”. According to this view, babies should therefore start receiving supplements at 1–3 months of age; moreover, the health workers agreed that weaning should commence when the baby is 3–4 months of age.

Thus, before the training programme, health workers in both the control and study areas did not seem to appreciate the importance of early initiation of or of exclusive breastfeeding.

### Training of health workers

As a result of the preparatory meetings, district level leaders agreed to promote the formation of breastfeeding support groups in their communities. Where there were no functioning community development committees, these were put in place and it was agreed that they would promote breastfeeding.

The PHC workers had appreciated that the training workshops were given in the vernacular and that they had gained new knowledge and learned new skills that they planned to employ in their work. This new knowledge included the importance of the early initiation of breastfeeding and of exclusive breastfeeding for the first 6 months of life, the benefits of colostrum, and the advantages of breastfeeding in reducing morbidity and mortality from

diarrhoeal and other diseases. The new skills included expression of breast milk, correct positioning and attachment of the baby to the breast, relaxation, and counselling. The advantages of breastfeeding for the mother and the role of men in promoting and supporting breastfeeding were also new for many of the workers.

A video recording of the trainers' workshop has been adopted for use by the teaching hospital's baby friendly hospitals' initiative for training PHC workers in other parts of Osun State.

### Early initiation of breastfeeding in primary perinatal facilities

Table 2 shows the use of perinatal facilities by mothers in the study and control areas. About two-thirds of the deliveries occurred at the PHC facilities, while a fifth occurred at home, usually unassisted by any trained health worker. The proportions delivered in PHC facilities were not significantly different in the two study areas.

In the intervention area, after training, 32% of the deliveries reported early initiation of breastfeeding (within 30 min of delivery) compared with only 6% in the control area (Table 2). This difference of 26 percentage points (95% confidence interval (CI): 16–36%) is statistically significant ( $\chi^2$  test = 21.97,  $P < 0.001$ ) and is accounted for almost entirely by the practices in the PHC facilities; all the 31 early initiators in ISLG (the study area) were from the 66 deliveries in the PHC facilities (47%),

while only 3 of the 68 deliveries (4%) at PHC facilities in the control area initiated breastfeeding early. This difference of 43 percentage points (95% CI: 29–55%) between the study and control PHC facilities is statistically significant ( $\chi^2$  test = 29.83,  $P < 0.001$ ). For the other non-PHC facilities, the differences in early initiation in the two areas were not significant (Fisher's exact test,  $P = 0.25$ , Table 2). There was therefore a marked and significant increase in early initiation of breastfeeding by mothers who delivered at perinatal facilities staffed by ISBFP-trained PHC workers.

### PHC workers' knowledge about and attitudes towards breastfeeding

The questionnaire study was used to assess further any differences in knowledge about and attitudes towards breastfeeding conferred by the training programme that might be related to the differences in practice between the two groups of PHC workers. A total of 80 of the 83 available PHC workers in ISLG (response rate, 96%) completed the questionnaire, including 66 of the 68 (97%) trained by ISBFP. In the control area, 52 of 56 PHC workers returned the questionnaire (response rate, 93%).

The results show that virtually all the PHC workers in both areas advocated prolonged breastfeeding (18–24 months: study area, 93%; control area, 85%) and demand breastfeeding (98% and 90%, resp.), and that all recommended the use of colostrum.

Table 3 shows the proportions of the various categories of PHC workers (ISBFP-trained, untrained, study area, and control area) who gave correct responses to seven indicator questions, and their aggregate knowledge scores. In all instances, trained PHC workers had better knowledge of and attitudes towards breastfeeding than untrained controls. For example, 89% of those who had been trained recommended early initiation of breastfeeding compared with 46% of controls. The difference in these proportions (43 percentage points; 95% CI: 28–58%) is statistically significant ( $\chi^2$  test = 26.06,  $P < 0.001$ ). In addition, 65 of 66 trained workers (98.5%) recommended exclusive breastfeeding (i.e., the baby receives no other foods or fluids other than breast milk) for the first 4–6 months of life compared with 19 of 52 (36.5%) controls. The difference in these proportions (62 percentage points; 95% CI: 49–75%) is also highly significant ( $\chi^2$  test = 51.43,  $P < 0.001$ ). Thus, the trained PHC workers, significantly more often than controls, recommended correct breastfeeding practices — early initiation of breastfeeding, avoidance of prelacteal feeds, and exclusive breastfeeding for the first 4–6 months of life.

Table 2: Use of primary health care (PHC) perinatal facilities in the study (ISLG) and control (ATLG) areas

	% in ISLG area		% in ATLG area
<i>Where delivered:</i>			
PHC facility	67 (66) <sup>a</sup>	$P = 0.26$	63 (68)
Home	21 (21)		25 (27)
Hospital	5 (5)		2 (2)
Other	6 (6)		10 (11)
<i>Who delivered:</i>			
PHC worker	71 (70)		65 (70)
Traditional birth attendant	11 (11)		2 (2)
Doctor	3 (3)		5 (5)
No health worker	14 (14)		27 (29)
<i>Early breastfeeding initiation:</i>			
Delivered at PHC facility	47 (31)	$P < 0.001$	4 (3)
Delivered at other facilities	0 (0)	$P = 0.25^b$	8 (3)
All deliveries	32 (31)	$P < 0.001$	6 (6)

<sup>a</sup> Figures in parentheses are the numbers of women.

<sup>b</sup> Fisher's exact test values.

ISBFP-trained PHC workers had an average knowledge score of 9.4 (Table 3), while those without training scored 6.1. The 3.3 score difference is highly significant (Kruskal–Wallis H test = 75.10,  $P < 0.001$ ). Also, the difference of 1.8 points between ISBFP-trained and untrained health workers in the ISLG study area is significant (Kruskal–Wallis H test = 18.17,  $P < 0.001$ ), as is the score difference of 3.5 between the study and control areas (Kruskal–Wallis H test = 69.64,  $P < 0.001$ ). Therefore, the trained health workers acquired significantly better knowledge of breastfeeding than their untrained colleagues.

A total of 45 of the total sample gave correct responses to all the breastfeeding items on the questionnaire. These included 44 of the 66 ISBFP-trained PHC workers, one other PHC worker from the study area, and none from the control area. Within the study area, this pattern of correct answers was significantly associated with the ISBFP training ( $\chi^2$  test = 14.3,  $P < 0.001$ ), while the difference between the ISBFP-trained health workers and those from the control area was also highly significant ( $\chi^2$  test = 52.47,  $P < 0.001$ ). Thus, the trained workers had significantly better knowledge about breastfeeding than their untrained counterparts.

Table 4 compares the odds ratios for the breastfeeding variables for the various categories of PHC workers. Although the sample size of the non-ISBFP-trained workers in the intervention area was relatively small, their results are also shown. The trained PHC workers made the correct recommendations on all aspects of breastfeeding significantly more often and had better breastfeeding knowledge for each aspect assessed than their untrained counterparts (Table 4, columns B and C). In addition, the knowledge and attitudes of the study area PHC workers were significantly better than those of the controls; and they made correct breastfeeding recommendations significantly more often than untrained workers in the control area (column D). Untrained PHC workers in the study area made correct recommendations on exclusive breastfeeding significantly more often than those in the control area and had significantly better knowledge of colostrum and of the mother-centred advantages of breastfeeding (column F). Within the study area itself, ISBFP-trained workers made the correct recommendations on breastfeeding initiation and prelacteal feeding significantly more often than those without such training, and had significantly better knowledge of the advantages of breastfeeding

Table 3: Proportion of PHC workers who gave correct responses to breastfeeding variables

	Study area			Control area (n = 52)
	ISBFP <sup>a</sup> (n = 66)	Untrained (n = 14)	All (n = 80)	
<i>Recommended:</i>				
Putting babies to breast within 30 min of delivery ( <i>bfinit</i> )	89	43	81	46
Against prelacteal feeding ( <i>aprelact</i> )	97	79	94	89
Against supplementary water ( <i>bfull</i> )	91	86	90	58
Exclusive breastfeeding for the first 4–6 months ( <i>bexclusv</i> )	99	93	98	37
<i>Knew:</i>				
Two advantages of colostrum ( <i>hwcolstr</i> )	82	57	78	12
Two advantages of breastfeeding for the child ( <i>advchild</i> )	90	57	84	44
Two advantages of breastfeeding for the mother ( <i>advmothr</i> )	91	64	86	33
Aggregate knowledge score <sup>b</sup>	9.4 (9.1–9.7) <sup>c</sup>	7.6 (6.6–8.6)	9.1 (8.8–9.4)	5.6 (4.7–6.5)

<sup>a</sup> Ife South Breastfeeding Project.

<sup>b</sup> Out of 10.

<sup>c</sup> Figures in parentheses are the 95% confidence interval.

Table 4: Maximum likelihood estimates for odds ratios for breastfeeding variables for various categories of ISBFP-trained and untrained PHC workers

Variables <sup>a</sup>	Odds ratios for:				
	ISBFP vs control area (B)	ISBFP vs untrained (C)	Study area vs control area (D)	Study area, trained vs untrained (E)	Study area, untrained vs control area (F)
<i>bfinit</i>	9.6 (3.5–29.8) <sup>b</sup> <i>P</i> < 0.001	9.9 (3.8–29.7) <i>P</i> < 0.001	5.0 (2.2–12.0) <i>P</i> < 0.001	10.7 (2.5–51.2) <i>P</i> < 0.001	0.9 (0.2–3.4) <i>P</i> = 0.54
<i>aprelact</i>	4.1 (0.7–43.6) <i>P</i> = 0.073	5.0 (1.0–49.4) <i>P</i> = 0.027	2.0 (0.5–8.6) <i>P</i> = 0.224	8.4 (0.9–110.9) <i>P</i> = 0.0353	0.5 (0.1–3.5) <i>P</i> = 0.287
<i>bffull</i>	22.9 (5.1–213.1) <i>P</i> < 0.001	16.8 (3.8–154.4) <i>P</i> < 0.001	18.4 (5.0–102.8) <i>P</i> < 0.001	2.4 (0.0–49.9) <i>P</i> = 0.443	9.3 (1.2–423.2) <i>P</i> = 0.012
<i>bfclusv</i>	107.8 (16.0–4660) <i>P</i> < 0.001	67.1 (10.3–2849) <i>P</i> < 0.001	64.9 (14.6–605.4) <i>P</i> < 0.001	4.9 (0.1–398.3) <i>P</i> = 0.3212	21.6 (2.8–987.7) <i>P</i> < 0.001
<i>hwcolstr</i>	32.9 (11.0–117.3) <i>P</i> < 0.001	16.2 (6.6–43.4) <i>P</i> < 0.001	25.5 (9.0–85.3) <i>P</i> < 0.001	3.3 (0.8–13.4) <i>P</i> = 0.054	9.7 (2.2–49.1) <i>P</i> = 0.001
<i>advchild</i>	10.4 (3.8–32.2) <i>P</i> < 0.001	9.3 (3.6–27.9) <i>P</i> < 0.001	6.4 (2.7–15.9) <i>P</i> < 0.001	6.1 (1.3–28.2) <i>P</i> = 0.0085	1.7 (0.4–6.7) <i>P</i> = 0.288
<i>advmothr</i>	19.9 (6.9–67.9) <i>P</i> < 0.001	15.0 (5.5–48.8) <i>P</i> < 0.001	12.6 (5.1–33.7) <i>P</i> < 0.001	5.4 (1.1–26.8) <i>P</i> = 0.020	3.6 (0.9–16.1) <i>P</i> = 0.034

<sup>a</sup> See Table 3 for an explanation of these codes.

<sup>b</sup> Figures in parentheses are the 95% confidence interval.

for the mother (column E). The training programme therefore seems to have conferred significantly better breastfeeding knowledge and attitudes on its recipients, enabling them to make correct breastfeeding recommendations more frequently.

In the univariate analyses, knowledge about early initiation of breastfeeding (*bfinit*) and adequate breastfeeding knowledge (a questionnaire test score of at least 9 out of 10) were associated with work location (study area), ISBFP training, and sex, but not marital status, work experience, skill category, or age. Multivariable analysis by logistic regression (Table 5) shows that ISBFP training was the only significant predictor of knowledge

about the early initiation of breastfeeding (odds ratio = 13.23; *P* < 0.001), suggesting the effectiveness of the ISBFP training. Also, work location in the study area (but not in the control area) and the ISBFP training were the only significant predictors of adequate breastfeeding knowledge (Table 5). This also suggests that the training programme has had a significant effect on changing workers' knowledge and attitudes about breastfeeding, even those in the study area who did not receive training.

Multivariate analysis of knowledge scores by stepwise multiple linear regression shows that location (the study area) and ISBFP training were the only variables that made a significant contribution to

Table 5: Logistic regression models of knowledge about breastfeeding and of its early initiation

Model	Parameters included	Odds ratio	Multivariate <i>P</i> -value
<i>bfinit</i> <sup>a</sup> ( <i>n</i> = 130)	Study (versus control) area	0.81 (0.23–2.88) <sup>b</sup>	0.747
	ISBFP training versus no ISBFP training	13.23 (3.38–51.77)	0.0001
	Male versus female	1.26 (0.34–4.68)	0.728
<i>knowledge</i> ( <i>n</i> = 130)	Study (versus control) area	10.89 (2.39–49.64)	0.0020
	ISBFP training versus no ISBFP training	6.33 (1.76–22.68)	0.0046
	Male versus female	1.36 (0.38–4.95)	0.6382

<sup>a</sup> Recommendation of early initiation (within 30 min of delivery) of breastfeeding.

<sup>b</sup> Figures in parentheses are the 95% confidence interval.

Table 6: Stepwise multiple regression model of breastfeeding knowledge scores<sup>a</sup>

Variable	$\beta$	SE	95% Confidence interval	Partial F-value	P-value
(Constant)	5.72	0.22	5.29–6.16		
Study area	2.06	0.47	1.12–3.00	18.86	0.0000
ISBFP training	1.78	0.46	0.86–2.69	14.68	0.0002
Nursing profession	-0.99	0.50	-1.91 to -0.01	3.97	0.0485

<sup>a</sup> R = 0.76; F-value = 56.33, df = 3, P < 0.001.

the model (Table 6). The mean contribution of the ISBFP training to knowledge scores was 18% (range: 9–27%), and that of the study area was 20% (range: 11–30%), again indicating the effectiveness of the training. Being a nurse (an indicator variable) had a marginal effect: being a nurse/midwife seems to have reduced the knowledge score by about 10% (range: 0–19%). Other occupational status indicator variables (age, sex, marital status, and length of experience as a PHC worker) had no significant effect on the model.

## Discussion

The following variables play a role in shaping mothers' decisions about whether to continue or terminate breastfeeding: maternal knowledge and attitudes; ethnic and cultural background; socioeconomic and employment status of the mother; other maternal factors; the availability of breast-milk substitutes; urbanization; and the health services. The work we have reported in this article has focused on changing, through training, health workers' knowledge, attitudes and practices about breastfeeding within the PHC services in rural communities.

Before the training programmes, many health workers and community leaders did not see the need to promote breastfeeding in a community where all mothers breastfeed. The workshops also showed that most of the health workers did not know how to position correctly and attach a baby to the breast. Community health workers in the study area are now promoting breastfeeding in all the health facilities in the local government area, and the local government authority has endorsed the promotion of breastfeeding.

The training of health workers can play an important role in the promotion, protection and support of breastfeeding (8, 10). Ife South is a "breastfeeding community"; however, the community did not understand the importance of early initiation of breastfeeding, the use of colostrum, or of exclusive and sustained breastfeeding. Also, the

community needed to be reintroduced to the skills of lactation management, correct positioning and attachment, and the expression of breast milk. A total of 68 of the 103 (66%) PHC workers in the study area underwent the training we have described.

The results we have reported suggest that the training enhanced the health workers' knowledge about and attitudes towards breastfeeding, and that these workers have had a positive impact on at least one aspect of breastfeeding behaviour in the community: mothers' timely initiation of breastfeeding. Focus group discussions before the training showed no differences in the knowledge of the health workers in the two areas. Thus, it appears that mothers' breastfeeding practices have improved as a result of changes in health workers' recommendations and practices brought about by the training.

ISLG health workers who did not have the training had significantly better knowledge about exclusive breastfeeding than controls, probably because of transfer of knowledge from their trained colleagues; there were, however, only 14 workers in this category.

The impact of health worker training on the practice of exclusive breastfeeding by the mothers should be assessed; however, we were not able to carry this out.

Exclusive breastfeeding is a relatively new and difficult concept to promote in the study communities. Initially most health workers, including doctors, thought that the breastfeeding project would not succeed, and half of the health workers in the control area still think it impossible for a breastfeeding baby not to have supplementary water. The reasons most often given are that the baby must be thirsty. These findings are not new (15); nevertheless, in a situation where household water supply is unsafe, such supplementation can lead to diarrhoea (16, 17), decrease breast milk intake by the baby, and reduce milk production by the mother (15). Thus it is important to promote exclusive breastfeeding and this may be the most sensitive variable that discriminates between trained and untrained health workers (see Table 4).

Early initiation of breastfeeding is a good predictor of exclusive (18) and prolonged breastfeeding (19). In our study, knowledge about early breastfeeding was most closely associated with the ISBFP training; moreover, improved worker's knowledge seems to have been synonymous with improved mother's practice. The incidence of early initiation of breastfeeding was significantly higher in ISLG facilities (staffed by the PHC workers) than in those in the control area. Probably, the health workers in the ISLG area more frequently recommended early initiation of breastfeeding and more often assisted their clients to do so than controls. These results accord with observations in Kenya that improved health worker knowledge and attitudes were associated with substantial improvements in breastfeeding-related hospital practices (10): as a corollary, the breastfeeding promotion campaign removed undesirable hospital practices such as separation of mother and baby, and use of formula feeding and of bottles.

Exclusive breastfeeding is still very rare in the rural study communities. Previously, based on data from focus group discussions, we predicted that the early initiation of breastfeeding and the feeding of colostrum would be easier to accept in such communities than changing the negative attitudes to exclusive breastfeeding (20). Further studies will be needed to demonstrate the impact of the health worker training on the acceptance and length of exclusive breastfeeding in the rural communities where the study was carried out.

Nevertheless, our results suggest that the training of extension health workers in rural communities is feasible, can have a beneficial impact on breastfeeding promotion, and that such training should be continued and incorporated into the primary health care system. In Nigeria, more than 75% of mothers live and receive perinatal care in rural communities and depend on the PHC workers for advice.

Also, breastfeeding education should be given to all types of health professionals, including doctors and medical students, (21). In the rural study communities, the nurse/midwife is the highest trained health professional available; our results show, however, that being a nurse or midwife was associated with low breastfeeding knowledge scores. If breastfeeding education were better integrated into the nursing curriculum, nurses would be better able to provide breastfeeding education in the community.

One important factor in the success of the training programme reported here was the administrative support given by the local government authorities, which is crucial for the success of breastfeeding pro-

motion efforts (22). Such support was guaranteed in our study since it was implemented as a community linkage programme that was jointly planned and implemented by community representatives, local government, and researchers (23). The training programmes were implemented by the investigators and the PHC workers themselves, and the district level training programmes were performed by the PHC workers who had attended the trainers' workshop. This assured the sustainability of breastfeeding promotion and training after the research project ended. As a result, the ISLG Health Department regards the training project as its own and its capacity has been enhanced to carry out such training. A partnership design, such as this, which has encouraged full community participation, should also enhance the sustainability of breastfeeding promotion in the rural study communities. In addition, the training and the resource materials developed from it were all in the local language, which is highly appropriate at the rural community level.

Long-term, demand breastfeeding is highly prevalent in rural communities in Nigeria (24, 25). With increasing urbanization, it is important to ensure that breastfeeding continues to be practised and to maximize its nutritional, immunological, and contraceptive advantages for mother and child health. Health worker training at the community level can therefore be an important component of strategies to achieve these aims.

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### Résumé

#### **Projet sur l'allaitement à Ife South: formation d'agents de vulgarisation pour encourager et prendre en charge l'allaitement dans les communautés rurales**

Le présent article rapporte les résultats de l'ISBFP (Ife South Breastfeeding Project: projet sur l'allaitement à Ife South), destiné à favoriser de meilleures pratiques d'allaitement dans les communautés rurales par la formation d'agents de vulgarisation dans la zone dépendant des autorités locales d'Ife South (Nigeria). Un atelier a été tout d'abord organisé pour les formateurs (agents de vulgarisation aux niveaux élémentaire et moyen) dans cette

région, puis ceux-ci ont à leur tour organisé des ateliers de formation dans chacun des dix districts sanitaires que compte cette zone. Aucune formation de ce genre n'a été organisée dans la zone témoin. Les agents de santé ont estimé que le programme de formation était utile et valable et ont recommandé que des programmes sur l'allaitement soient organisés régulièrement pour l'ensemble du personnel. En conséquence, les autorités locales ont adopté une politique en faveur des nourrissons pour les installations de soins périnataux primaires.

Les discussions au sein de groupes de réflexion avant la formation ont montré que les agents de soins de santé primaires pensaient qu'il fallait commencer l'allaitement dans les 24 heures suivant la naissance mais pas dans les six premières heures et qu'il était impossible d'y avoir recours exclusivement (sans apports hydriques complémentaires). Il n'y avait aucune différence entre les deux zones. Au total, 68 des 85 agents de soins de santé primaires dans la zone étudiée ont reçu la formation de l'ISBFP.

L'évaluation après la formation a montré que le début précoce de l'allaitement (dans les 30 minutes suivant la naissance) a eu lieu pour 32% des 98 naissances dans la zone étudiée, contre 6% des 108 naissances survenues dans la zone témoin ( $\chi^2 = 21,97 - p < 0,001$ ). Dans les installations de soins périnataux primaires ayant des agents de soins de santé primaires, le début précoce de l'allaitement a eu lieu pour 47% des 67 naissances dans la zone étudiée, contre 4% des 68 naissances survenues dans la zone témoin ( $\chi^2 = 29,83 - p < 0,001$ ). Les tests de connaissances sur l'allaitement ont donné des résultats significativement meilleurs pour les agents de santé formés par l'ISBFP que pour ceux n'ayant pas été formés dans la zone témoin (test H de Kruksal-Wallis = 75,10 —  $p < 0,001$ ) ou dans la zone d'étude (test H de Kruksal-Wallis = 18,17 —  $p < 0,001$ ). Beaucoup plus d'agents de soins de santé primaires formés par l'ISBFP que d'agents non formés ont recommandé le début précoce de l'allaitement (89% contre 46%;  $\chi^2 = 26,06 - p < 0,001$ ) et l'allaitement exclusif (98% contre 37%;  $\chi^2 = 51,43 - p < 0,001$ ). L'analyse multivariable a indiqué que les résultats du test de connaissances étaient liés à la zone d'étude ( $p < 0,001$ ) et au programme de formation ( $p < 0,001$ ), mais pas à l'âge, au sexe, à la situation matrimoniale ni à l'expérience de l'agent de soins de santé primaires. Ils sont cependant liés de façon marginale à la qualification d'infirmière ou de sage-femme. Quarante-quatre des 66 agents formés par l'ISBFP ont donné 100% de réponses correctes au questionnaire contre 1 sur 14 de ceux n'ayant pas été formés dans la zone

d'étude ( $\chi^2 = 14,3 - p < 0,001$ ) et aucun des 52 agents de soins de santé primaires dans la zone témoin ( $\chi^2 = 52,47 - p < 0,001$ ).

Ces résultats indiquent que la formation de l'ISBFP a permis d'augmenter les connaissances des agents de soins de santé primaires et d'améliorer leurs conseils, et qu'il en est résulté de meilleures pratiques d'allaitement maternel dans la zone étudiée. L'éducation appropriée des agents de vulgarisation n'est donc pas seulement faisable; elle contribue également de manière significative à la promotion de l'allaitement dans les communautés rurales. Ces résultats indiquent aussi que l'allaitement devrait être intégré dans les programmes de formation de toutes les catégories de personnel soignant.

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