

ORIGINAL

Receipt: 2017 November 17
 Accepted: 2018 January 30
 ePublished: 2018 June 18

EFFECTIVENESS OF AN INTERVENTION TO IMPROVE BREASTFEEDING KNOWLEDGE AND ATTITUDES AMONG ADOLESCENTS(*)

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(*) Fundig: This study was funded by Fundación Canaria de Investigación y Salud (FUNCIS) (PI Enf 17/07)

The authors declare no conflict of interest regarding the publication of this article.

ABSTRACT

Background: Breastfeeding constitutes a priority in Public Health due to the multiple benefits it offers. The decision to breastfeed is usually made before pregnancy, and therefore it is important to include adolescents in breastfeeding promotion programmes. The aim of the study was to evaluate the effectiveness of a programme to improve knowledge and attitudes toward breastfeeding among teenagers.

Method: Pre-test-post-test randomized controlled study, carried out in 2008 in Tenerife. 970 teenagers participated (14,6±0.9 years), 506 experimental group (EG) and 524 control group (CG). Before the intervention and 4 weeks after, students completed a questionnaire to evaluate their knowledge and attitudes towards breastfeeding. The performed intervention consisted of: a talk, video projection, informative leaflets, narrative short stories and role-play activities. Chi-square test, student's t-test, Cronbach's alpha coefficient, repeated measures variance analysis and covariance analysis were used.

Results: There were no significant differences between the two groups regarding knowledge (EG: 3.9±1.5, CG: 3.8±1.5) or attitudes towards breastfeeding, before the intervention. The same applies when compared by gender, school year, parents' occupation and type of school. The post-intervention questionnaire showed a significant increase in the level of knowledge of students from EG (EG: 6.9 ± 1.5, CG: 4.4 ± 1.8; p < 0.001) as well as a higher percentage of positive attitudes towards breastfeeding (GE: 71.13±28.5, GC: 54.27±28.9, p<0,001). Covariance analysis showed a significant effect (p<0,05) on attitudes towards breastfeeding of the variables gender and previous contact with breastfeeding.

Conclusions: The educational program carried out is effective as a method to improve knowledge and attitudes toward breastfeeding among teenagers.

Key words: Breastfeeding; Adolescent; Health Education.

RESUMEN

Eficacia de una intervención para mejorar conocimientos y actitudes sobre lactancia materna en adolescentes

Fundamentos: La lactancia materna (LM) por sus múltiples beneficios constituye una prioridad en salud pública. La decisión de amamantar generalmente se toma antes del embarazo, siendo importante incluir a los adolescentes en los programas de promoción. El objetivo del estudio fue evaluar la eficacia de un programa dirigido a mejorar los conocimientos y actitudes de los adolescentes sobre la LM.

Métodos: Estudio longitudinal pre-post-intervención, controlado y aleatorizado, realizado en 2008 en Tenerife. Participaron 970 adolescentes (14,6±0,9 años), 506 en el grupo experimental (GE) y 524 en el grupo control (GC). Antes de la intervención y a las 4 semanas cumplimentaron un cuestionario sobre conocimientos y actitudes hacia la LM. La intervención incluyó: charla, vídeo, folletos informativos, relatos y rol-play. Se han utilizado las pruebas chi-cuadrado, t de student, coeficiente Alfa de Cronbach, análisis de varianza de medidas repetidas y análisis de covarianza.

Resultados: Antes de la intervención no había diferencias significativas entre ambos grupos en los conocimientos (GE: 6.9±1.5, GC: 4.4±1.8) y actitudes sobre LM, ni diferencias asociadas al sexo, curso escolar, profesión de los padres y tipo de colegio. Tras la intervención, el GE registró un aumento significativo en sus conocimientos (GE: 6.9±1.5, GC: 4.4±1.8 p<0,001), así como un mayor porcentaje de actitudes positivas hacia la LM (GE: 71.13±28.5, GC: 54.27±28.9, p<0,001). El análisis de covarianza reflejó un efecto significativo (p<0,05) de las variables sexo y contacto previo con la LM en las actitudes.

Conclusiones: El Programa Educativo desarrollado es eficaz para mejorar los conocimientos y actitudes sobre LM en adolescentes.

Palabras clave: Lactancia materna, Adolescentes, Educación en salud.

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Suggested citation: Hernández Pérez MC, Díaz-Gómez NM, Romero Manzano AM, Díaz Gómez JM, Rodríguez Pérez V, Jiménez Sosa A. Effectiveness of an intervention to improve breastfeeding knowledge and attitudes among adolescents. Rev Esp Salud Pública. 2018;92: June 18 e201806033.

INTRODUCTION

Low prevalence of breastfeeding (BF) is a worldwide problem despite all the promotion campaigns carried out by WHO/UNICEF/IHAN^(1,2) and in spite of the enormous benefits breastfeeding offers. According to the data published in the last National Health Survey⁽³⁾, the exclusive breastfeeding rate at six weeks after birth was 66,16%, and the rate went down to 28,53% after six months. Presently, early weaning is related to socio-cultural factors like personal prejudices, work conditions and attitudes towards breastfeeding in public as well as a lack of support from health professionals⁽⁴⁾.

In spite of the efforts to promote breastfeeding in public over the last few years and slight improvements regarding breastfeeding rates in Spain⁽³⁾, many teenagers are not used to seeing babies being breastfed. Their childhood memories are of dolls with baby bottles and at home and school, when there is talk about healthy eating habits, BF is not usually mentioned. For all these reasons, it is important to promote images of women breastfeeding and recover the nutritional role of the breast, apart from the aesthetic and sexual role.

If BF is a worldwide priority and the decision to breastfeed is usually made before pregnancy, it is important to provide teenagers with the correct information about BF, for the moment when they become parents in the future. With this aim, we set about the present study to evaluate the effectiveness of an educational programme aimed at improving knowledge and attitudes towards BF among teens. It is during this stage of life that people are most ductile and it is possible to achieve an internalization of BF culture, increasing their knowledge, usually scarce on this topic and counteracting myths and false beliefs.

SUBJECTS AND METHODS

Design. Longitudinal study of educational intervention (pre-post), controlled and randomized, carried out in 2008.

Subjects. 970 students from Tenerife, 3rd and 4th year of High School, medium age: $14,6 \pm 0,9$ years of age (table 1). The classrooms were assigned randomly to experimental group (N=525) or control group (N=445).

A questionnaire was used to evaluate knowledge and attitudes towards breastfeeding, which had been used in a previous piloted study⁽⁵⁾. In that study, the reliability of the questionnaire was estimated using the test-retest procedure, calculating the coefficient of correlation obtained from the knowledge items score with an interval of two weeks ($r=0,777$; $p<0,0001$).

A short questionnaire was used, 16 items with closed answers; since it was considered that, in order to ensure the student's collaboration, it was necessary to make sure it wasn't time consuming. The items were chosen bearing in mind the recommendations contained in the literature^(6,7) and were evaluated a priori by professors and experts in breastfeeding. It was found that the questions were appropriate relevant, representative and clear for the age of the students.

The questionnaire included:

– Eleven items concerning BF knowledge, conceding one point for each correct item and zero for each incorrect item. A global score was obtained from the sum of all of them, justified because the Alfa de Cronbach coefficient reached a high value (0,68).

– Five items regarding attitudes towards BF. Given their heterogeneity (the Alfa de Cronbach coefficient value was a mere 0,32) the answers were not considered conjointly, taking into account that the more heterogeneous the items on a scale, the smaller the corresponding alpha coefficient. In general, with values below 0,6 or 0,7 it is not recommendable to analyse the answers conjointly but separately. It was considered as a positive attitude toward BF those who answered affirmatively to the question: "Do you approve of breastfeeding in public?", those who

planned to breastfeed their future children, those who considered that breastfeeding did not have a negative effect on the breast, those who despite thinking that the breast was affected negatively thought that this would not be a reason to give bottle feed and those who considered breastfeeding easier for the mother than bottle feeding.

Other variables included were:

- Previous experience on BF within the family (Do you know if your siblings have been breastfed? Have you seen someone in your family or other women breastfeeding?). Each affirmative answer received 1 point, the maximum being 4 for this variable.
- Demographic variables: gender, public school or semi-public, school year and parents' professions⁽⁸⁾.

The main independent variable was the Intervention and the dependent variables: the level of knowledge and attitudes towards BF.

The control variables were: gender, school year, type of school and previous BF experience within the family.

Interventions. All the students completed the questionnaire at the beginning of the study. Students in the classrooms assigned to the control group (CG) did not receive any intervention, while those in the experimental group (EG) participated in the following activities, structured in two sessions. The first one included:

- An interactive talk about BF that lasted forty minutes. Special emphasis was placed on clarifying the most frequent misconceptions observed in the previous pilot study. The talk was given by three members of the research team using the same Power Point presentation and was aimed at normalizing the image of breastfeed babies and modifying the sexual role of the breast. A total of 40 slides were shown of babies of different ages and races, some breastfeed and others enjoying the skin

to skin contact with the mother. In order to underline our condition as mammals, photos of animals feeding their offspring were also shown. And to demonstrate that in other historical periods BF was considered as something natural by all sectors of society, religious images we included, like Virgins breastfeeding. In all cases, the expressions of mothers and children were of happiness and incited to tenderness, to capture the attention of the group. Finally, a succession of photos of a childbirth was intended to emphasize that skin-to-skin contact with the mother and the early onset of breastfeeding is natural after childbirth. The talk was followed by a debate where students actively participated.

- At the end of the talk and debate, four students were asked to participate voluntarily in the representation of a two acts short comedy, where a couple who are going to be parents think over the decision to breastfeed or bottle feeding their future child. The characters of two grandmothers, who created doubts and debate, were also included. They were given the text so they could rehearse.

- An informative leaflet about BF prepared for this study, adapted to the age of the schoolchildren, was distributed.

The second session was carried out one week later and included the following activities: a video projection about BF, the narration of short stories about anecdotes in the practice of BF and the representation of a short comedy.

Four weeks after starting the intervention, the questionnaire was completed again by the students of both groups, in order to measure the effectiveness of the educational program.

The study was approved by the ethical committee of the University Hospital of the Canary Islands and received the authorization of the directors of the teaching centers in which it was developed and of the students, whose participation in the study was voluntary.

Statistical analysis. The sample size was calculated based on the population of students in 3rd and 4th year of High School, in public and semi-public schools (17.013, information provided by the Board of Education of the Canary Islands Government), for a power of 80%, error type I 5% and a 10% estimated losses.

The chi-square test, Student's t-test for independent samples and for related samples, Mann-Whitney test, Correlation analysis, Cronbach's Alpha coefficient, analysis of variance of repeated measures and analysis of covariance analysis were used. The statistical analysis was carried out with the SPSS 15.0 statistical package (SPSS Inc. Chicago, Illinois). The contrasts with a probability value less than 0.05 were considered significant.

RESULTS

The characteristics of the students are described in **table 1**. 44 questionnaires were rejected as they were not correctly completed (answers in blank, lack of identification number, etc.).

Pre-intervention questionnaire. We verified that before the intervention there were no significant differences in the total score on

the knowledge scale, which was low in both groups. On a scale of 8 points, the average score in EG was 3,9 points (DE:1,5) and in CG 3,8 points (DE:1,5).

45,3% of the students surveyed were not aware that all women produce milk after giving birth. 63,7 % thought that it was necessary to supplement breastfeed with bottle-feed. 60,7% believed that mothers milk was not always suitable for feeding newborns. A parameter that a considerable number of students did not know was the advised duration for breastfeeding. Only 15,3% answered up to two years of age (recommended by the WHO). To the question "What do you think is the most important thing when a child is born?", 71.7% of adolescents indicated the correct option that the newborn must remain with his mother after childbirth. However, the 74,8% of the participants did not know how often a newborn should be fed. **Table 2** shows the percentage of correct answers regarding knowledge items in the two study groups (EG and CG) separately.

As for attitudes towards BF, there were no significant differences between the two groups in the pre-intervention questionnaire.

Table 1
Characteristics of participants

Variables		Experimental Group	Control Group
Age (years) m±ds		14,7±0,9	14,6±0,8
Sex N (%)	Male	243 (48,3)	208 (49,2)
	Female	260 (51,7)	215 (50,8)
Father's Profession N (%)	Class I	136 (27,1)	107 (25,2)
	Class II	85 (17)	95 (22,4)
	Class III y IV	281 (56)	221 (52,2)
Mother's Profession N (%)	Class I	114 (22,7)	91 (21,5)
	Class II	112 (22,3)	84 (19,8)
	Class III y IV	277 (50)	248 (58,6)
Previous experience on BF within the family N (%)	Yes	120 (23,8)	85 (20,1)
	No	383 (76,2)	338 (79,9)

BF = breastfeeding; m = average; ds = standard deviation; N = number. No significant differences between groups.

Table 2
Percentages of correct answers on the breastfeeding knowledge test and score on the knowledge scale, in the control and experimental group, before and 4 weeks after the intervention

ITEMS of KNOWLEDGE (options)	Correct answers (%) Pre-intervention		p (χ^2) ^a	Correct answers (%) Post-intervention		p (χ^2) ^b
	EG	CG		EG	CG	
	All women produce milk after giving birth? (Yes/No)	55,3		53,9	0,67	
Is the milk of all women suitable to feed a baby? (Yes/No)	39,4	39,1	0,93	74,8	41,2	<0.0001
Is it convenient to give bottle feed after breastfeed to supplement the intake?	35,3	37,3	0,54	88,0	33,8	<0.0001
Up to what age can a baby be breastfed? (3 months/6 months/ Until his teeth come out / Up to 2 years or more)	15,8	14,7	0,63	70,4	24,3	<0.0001
BF, in addition to being a food source, Does it offer other benefits? (Yes/No)	80,0	79,7	0,88	92,7	76,7	<0.0001
How often should a new born breastfeed during the day? (4 times a day/Every 3 hours/ Whenever the baby wants)	25,9	24,5	0,64	83,6	37,9	<0.0001
How often does a newborn have to be breastfed at night? (At night he should not eat / Every 3 hours / Every time the baby wants)	31,7	32,1	0,89	83,8	43,4	<0.0001
What do you think is the most important thing when a child is born? (Bathe him / Leave him in contact with his mother / Take him to the Nest so that the mother rests / Give him a bottle-feed)	71,3	72,3	0,74	95,6	81,3	<0.0001
SCORE (Number of correct answers) OF THE KNOWLEDGE SCALE	Pre-intervention		p(t) ^a	Post-intervention		p(t) ^b
	EG m \pm sd	CG m \pm sd		EG m \pm d	CG m \pm sd	
	3,9 \pm 1,5	3,8 \pm 1,5		0,45	6,9 \pm 1,5	

EG= experimental group; CG= control group; m=average; sd=standard deviation; ^aComparison between EG and CG before intervention; ^b Comparison between EG and CG four weeks after intervention.

63,1% of the adolescents thought that breast-feed would have a negative effect on breast appearance and 57% thought that bottle-feeding is easier than breastfeeding. Table 3 shows the percentages of positive attitudes towards breastfeeding in the three items included in the study, in both groups.

Pre-post test comparison. For the analyzes aimed at assessing the effectiveness of the intervention (pre-post test comparison),

three knowledge items were removed from the questionnaire, one because more than half of the students (52.4%) did not answer it (“Mention some benefit of BF in addition to the nutritional”) and two other because the was a very high percentage of correct answers (above 95%) before the intervention: 96,6% of the teens knew that breast milk and formula milk are not equally good for feeding a baby, and 98,3% recognized that the ideal feeding for a newborn infant is his mother’s milk.

Table 3
Percentage of positive attitudes towards breastfeeding, before and 4 weeks after the intervention

ATTITUDE ITEMS (options)	Positive Attitudes (%) Pre-intervention		p (χ^2) ^a	Positive attitudes (%) Post-intervention		p (χ^2) ^b
	EG	CG		EG	CG	
	Does it seem right to you that a mother breastfeed in public?: (Yes/No)	73,1	68,0	0,10	84,8	74,9
Do you think breastfeeding would have a negative effect on breast appearance? (Yes/No)	35,1	39,1	0,23	50,1	35,4	<0,0001
What is easier for a mother? (Bottle feeding/ Breastfeed).	43,3	42,6	0,86	64,3	51,6	<0,0001

EG= experimental group; CG= control group; ^a Comparison between EG and CG before intervention; ^b Comparison between EG and CG four weeks after intervention.

Two items regarding attitudes were also removed. One owing to the high percentage of affirmative answers, 95,1% in the item: “In the future when you have a baby, would you give them breastfeed?” and another owing to the high percentage, 40%, that did not respond, in the item: “If breastfeeding has a negative effect on breast appearance, would that be a reason to bottle-feeding?”

After the intervention, the correct answers regarding knowledge and attitudes increased in a significant manner in the EG (tables 2, 3).

In order to confirm the effect of the intervention on BF knowledge, a variance analysis was carried out with two factors, Group (Control and Experimental) and Moment (Before and 4 weeks after the intervention). The BF knowledge scale score was included as a dependent variable. The most relevant result is the interaction between both variables [F (1,692) = 263,45 p < 0,001]. As may be observed in figure 1, there was a noticeable increase in the level of knowledge only among the students who took part in the intervention group, whereas there were no changes in the control group students.

As for the three attitude items, the variance analyses, made following the same outline of the knowledge scale analyses, showed a clear improvement in the group of students that

received the intervention while those of the control group, maintained an attitude towards breastfeeding without appreciable changes. See figure 2 (What is easier for the mother: bottle feeding or breastfeed? F (1,821) = 20,87 p < 0,001), figure 3 (Does it seem right to you that a mother breastfeed in public?: F (1,813) = 12,92 p < 0,001) and figure 4 (Do you think breastfeeding would have a negative effect on breast appearance?: F (1,822)=57,55 p<0,001),

Once the global effect of the intervention was established, covariance analyses were carried out to evaluate if other variables included in the study (school year, gender, type of school: private or semi-private, previous contact with BF and the parents’ profession) could be modulating this effect. Only the variables “previous contact with BF” and “gender” were shown to have a significant effect on the attitude items. The teens that had previous experience on BF within the family showed more positive attitudes towards breastfeeding in public and considered breastfeeding easier than bottle-feeding. On the other hand, the female subjects were more worried about the possibility that breastfeeding would have a negative effect on breast appearance, compared to male subjects (table 4). We also found that the effect of the intervention on the attitudes remained after controlling the

Figure 1
Score of the knowledge scale about breastfeeding, according to the Group (intervention or control) and the Moment (before or after intervention)

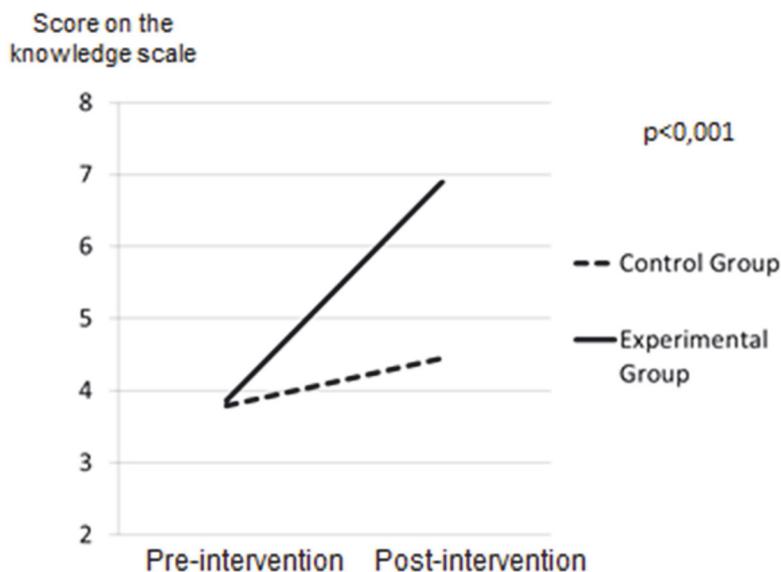


Figure 2
Score of item: “What do you think it is easier for the mother, bottle feeding or breastfeed?” (1=breastfeed, 0=bottle feeding), according to the Group (intervention or control) and the Moment (before or after intervention)

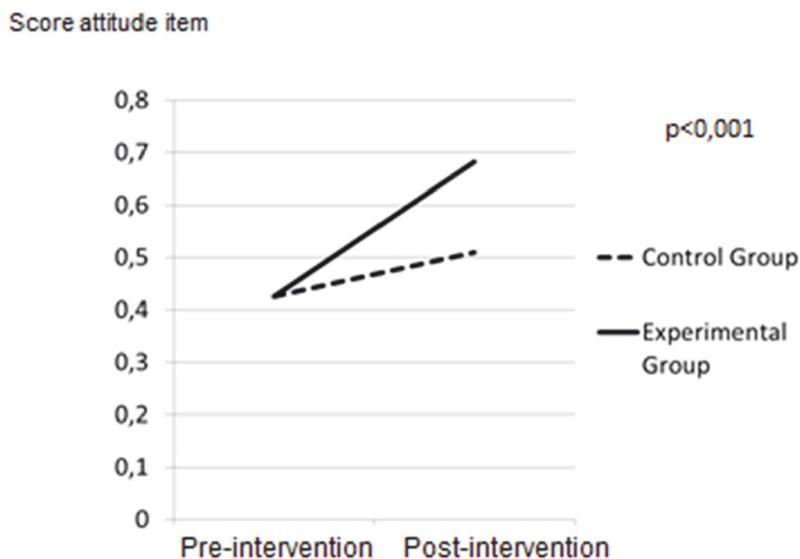


Figure 3

Score of item: “Does it seem right to you that a mother breastfeed in public?” (1=yes, 0=no), according to the Group (intervention or control) and the Moment (before or after intervention)

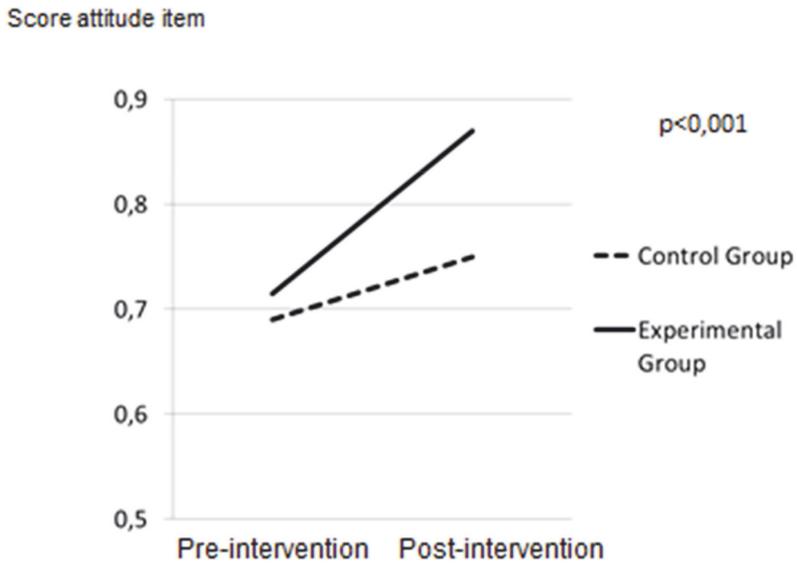


Figure 4

Score of item: “Do you think breastfeeding would have a negative effect on breast appearance?” (1=no, 0=yes), according to the Group (intervention or control) and the Moment (before and after the intervention)

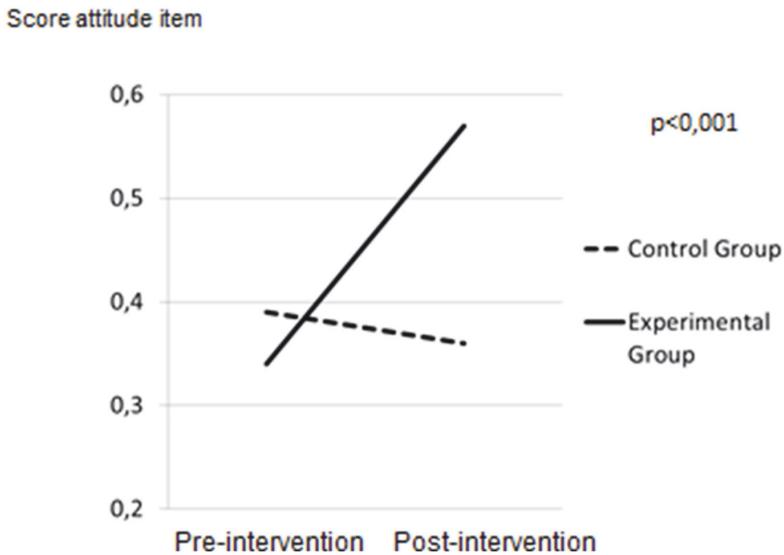


Table 4
Co-variables with significant effects about attitudes towards breastfeeding

ITEM	Co-variable	Associated statistic
What is easier for the mothers: bottle feeding or breastfeed?	Previous contact with BF	$F(1, 588) = 3,69$ ($p < 0,05$)
Does it seem right to you that a mother breastfeed in public?	Previous contact with BF	$F(1, 581) = 11,73$ ($p < 0,001$)
Do you think breastfeeding would have a negative effect on breast appearance?	Gender	$F(1, 591) = 4,58$ ($p < 0,05$)

influence of the aforementioned covariates. These variables had no significant effect on the knowledge scale about BF.

DISCUSSION

The intervention program developed in our study in a large sample of adolescents of both sexes, showed a positive effect on knowledge and attitudes towards breastfeeding. Although there are numerous studies concerning the level of knowledge about breastfeeding, carried out in teens and young people^(9,10,11,12,13,14,15), as well as in the adult population⁽¹⁶⁾, we have only found seven studies^(16,17,18,19,20,21,22) that analyze the effects of an educational intervention aimed at improving knowledge and attitudes towards BF in adolescents, all of them carried out outside of Spain. Only five of these studies^(17,18,19,20,21), evaluate, like our study, the effectiveness of the developed programme and included a control group. In two of these studies^(17,21) the intervention program was aimed only to female adolescents (421 in Kim's study⁽¹⁷⁾ and 204 in Ho's study⁽²¹⁾). Both in these two studies, and in that of Walsh et al.⁽¹⁸⁾, carried out in 121 schoolchildren of both sexes, the intervention program was short, and consisted of a talk and in two of them, a video, about the benefits of BF. In the Fujimori's study⁽¹⁹⁾, which included 503 school children of both genders, the intervention program was limited to a talk. In the Bottaro and Giubellino's study⁽²⁰⁾, in which 564 students participated, between 9 and 17 years old, a broader educational program was

developed. Among other activities, the students were asked to bring photos, if they had them, of when they were babies taking breast milk, to videotape scenes about BF, to show them later to the whole class. In all of them, it was found that the interventions had a positive effect on both attitudes and knowledge about BF of adolescents.

Compared to these five works, the sample size of our study was larger, a questionnaire validated in a previous pilot study was used, the educational intervention was broader and the program developed was structured bearing in mind the specific characteristics of the adolescents. In the talks, a strategy was followed so that the topic could arrive adequately in three important aspects: clear and precise language, attractive images and position of closeness on the part of the speakers. Students also received written information about the benefits and practice of BF. A video was screened and they participated in the narration of short stories and in the representation of a two acts short comedy about certain aspects of the socio-family environment that might influence the decision to breastfeed.

Coinciding with other authors⁽¹⁹⁾, in our study we found that although most adolescents accept that women breastfeed in public places, a not insignificant percentage, around 30% of the respondents, before the intervention program, did not consider it appropriate. It is important to develop policies that contribute to normalize the image of a mother

breastfeeding in public, so that adolescents perceive this as something natural and not erotic⁽²³⁾.

Very few teens knew that the WHO recommends breastfeeding during 2 years or more^(24,25), which accord with the low breastfeeding rates after six months in our country⁽³⁾. In the Li *et al.*'s study⁽¹⁶⁾ carried out in the USA, 31% of the adults surveyed thought that breastfeeding is not appropriate for children older than 1 year.

In our study, more than half of the students surveyed before beginning the educational program, considered easier bottle-feeding than breastfeed. Several authors have also found that both, the adults and the adolescents, consider BF as something complicated^(14,26) and have the perception that it restricts women's freedom and their lifestyle⁽¹⁶⁾.

In studies carried out in the adult population^(28,29,30) it has been found that aesthetic factors, previous experience with BF and the difficulty to combine breastfeeding with work activity, influence both, the choice of feeding method and the duration of breastfeeding. In the literature reviewed, we have only found one study⁽³¹⁾ that, like ours, analyzes the influence of these factors on attitudes toward breastfeeding in adolescents. In agreement with them, we found that previous experience on BF within the family improves attitudes towards breastfeeding, concretely, regarding breastfeeding in public and consider breastfeeding as an easy task. On the other hand, in our study we also found that, similarly to adults, there was more concern regarding the aesthetic implications of breastfeeding among female teens.

The results of the study are of interest, due to the scarcity of similar work in our country. However, the fact that the intervention, due to its characteristics was not blind, limits to a certain extent the generalization of the results. Another limitation can be derived from the recall bias in the variables that involved retrospective information (for example, if the

adolescents surveyed or their siblings had been breastfed), although we believe that the strong experience of such events by the family minimizes this bias. Finally, the students in the control group slightly improved their knowledge and attitudes towards breastfeeding, although not significantly and to a much lesser extent than the students who directly received the intervention, what could be attributed to the fact that, although the randomization was performed by classrooms, the students shared the leisure time and the lunchroom, and possibly commented on the activities in which they had participated, since they were novel for them.

The main conclusion of this study is that the intervention, which was developed in a broad sample of adolescents, had a positive effect on knowledge and attitudes towards BF. The percentage of adolescents who think that breast milk is enough to feed a baby without having to supplement with formula, increased. It also increased the percentage of those who believed that breastfeeding has no schedule, which should be on demand. It also increased the percentage of teens who felt that BF is recommended until two years of age and that all mothers produce adequate milk to feed their child. Lastly, both the percentage of students who considered inappropriate breastfeeding in public places and those who considered that breastfeeding would have a negative effect on the appearance of breasts, decreased.

The decision to breastfeed in many cases is taken before pregnancy and even long before deciding to have a child^(32,33), therefore, based on the results of this study, it can be established the recommendation that the information on BF is given precociously, before adolescents begin life as a couple and include students of both sexes in the educational programs on BF, because it is known that men will have an important influence on the decision of the woman about the feeding method that she will choose for her son and on the success or failure of breastfeeding^(34,35). The

intervention program developed in this study proved to be effective in the short term in improving knowledge and attitudes of students towards breastfeeding. We deem necessary the development of future studies in order to analyze whether this positive effect remains longer term and if so, recommend its implementation in school centers incorporated in the curriculum of educational programs, within the transversal subject of Education for Health. These educational intervention programs could be developed using new technologies; internet, Apps, social media and could successfully replace traditional methods of promoting BF⁽³⁶⁾.

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