Improving Breastfeeding Knowledge, Attitudes, and Practices of WIC Clinic Staff

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SYNOPSIS

Objective. This study was conducted to assess the impact of a breastfeeding promotion clinic environment project implemented by the state of Mississippi on breastfeeding knowledge, attitudes, and practices of WIC clinic staff.

Methods. Thirteen pairs of matched intervention and comparison WIC clinics participated in the study. Clinical and administrative staff completed pre-test and post-test self-administered questionnaires in 1998 and 1999.

Results. A total of 397 staff members provided pre-test data, and 277 staff members provided post-test data. Before project implementation, the intervention and comparison groups were similar overall. The majority of staff had positive attitudes/beliefs about breastfeeding, but gaps in knowledge and practices were noted. Post-test data showed that the project improved knowledge, attitudes/beliefs, and confidence/practice of intervention clinic staff.

Conclusions. Clinic environment projects, which combine physical improvements and staff training, are effective in promoting support for breastfeeding among public health clinic staff. Similar interventions may contribute to the overall effectiveness of breastfeeding promotion programs.

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Breastfeeding rates are low among participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC program) relative to the general population. In 2000, breastfeeding rates for WIC infants were 57% at hospital discharge and 20% at 6 months, while breastfeeding rates for all infants were 68% at hospital discharge and 31% at 6 months.[1] Rates are particularly low in the Southern states. For example, in 2000, breastfeeding rates for WIC infants in the state of Mississippi were 38% at hospital discharge and 10% at 6 months.[1]

Breastfeeding promotion among low-income women is a challenge, because there are numerous barriers to address. Research conducted by Best Start Social Marketing, Inc., as part of the U.S. Department of Agriculture (USDA) national breastfeeding promotion project, "Loving Support Makes Breastfeeding Work," revealed that inconsistent information and a perceived lack of support from health professionals are barriers to initiating and continuing breastfeeding among low-income women.[2] Other barriers include embarrassment about breastfeeding and lack of support from family and friends. The results were consistent with those of other studies that have documented the importance of health professional support for breastfeeding promotion.[3–7] The Cochrane review is particularly noteworthy.[8] This review of 20 trials of support for breastfeeding provided clear evidence for the effectiveness of professional support on the duration of any breastfeeding.

Although professional support is associated with breastfeeding rates, many professionals are not prepared to provide good breastfeeding counseling to their clients. Research conducted in Southeast U.S. revealed that many WIC clinic staff do not promote breastfeeding because they do not feel knowledgeable and able to handle breastfeeding problems that may arise.[2] National and statewide surveys found gaps in knowledge about breastfeeding among nurses,[9,10] physicians and residents,[11–14] and nurse practitioners and nurse midwives.[15] Other studies indicated that provider practices could be enhanced. A survey of physician offices found that the majority of offices accepted and routinely distributed publications and products that did not protect, promote, or support breastfeeding.[16] Surveys of women found that nurses provided more encouragement and breastfeeding counseling than physicians, with opportunities for improvement among all providers.[4,17] Time factors, including shortened length of stay, and lack of knowledge were perceived to be the primary barriers for nurses in helping mothers to breastfeed.[18]

Numerous breastfeeding education and training programs have been implemented to increase support for breastfeeding among providers. In cases where evaluation studies of the programs were conducted, a generally positive impact was documented. For example, the state of Wisconsin implemented the Lactation Educator Training Program (developed by the University of California at Los Angeles) and found that the program improved trainees' knowledge and generated breastfeeding promotion and support activities across the state.[19] Evaluation of the Breastfeeding Update Course for Health Professionals, another voluntary in-service on breastfeeding, also indicated that the program was successful.[20] Only one study showed that the implementation of a breastfeeding protocol in hospital settings did not alter the knowledge scores of health professionals and mothers.[21]

Similar results were noted in other countries. Two workshops based on case studies improved the breastfeeding knowledge of health professionals in Australia.[22] Antenatal breastfeeding workshops increased the confidence of midwives at a Tasmanian teaching hospital in their ability to support mothers to breastfeed.[23] A breastfeeding promotion campaign, including health worker training, improved health worker knowledge and hospital practices in Kenya.[24] Finally, a three-day course presented in Chile resulted in changes in reported clinical practices among participants, which supports the concept of the Baby-Friendly Hospital Initiative that an 18–24 hour course can change clinical practices.[25]

Peer counseling can be used in conjunction with provider counseling to further promote breastfeeding. Peer counseling programs were found to increase breastfeeding rates among low-income women in rural[26] and urban areas[27] of the U.S. Similar programs, including a home visitor program[28] and a trained community health extension worker program[29] were found effective in breastfeeding promotion in other countries. Such findings led researchers to conclude in a recent literature review that social support from both informal social network members (male partners, mother, family/friends) and professional network members (health care professionals, lactation consultants) is critical for reversing the current worldwide decline in breastfeeding rates.[30] Such findings have also driven public and private agencies to develop social support programs for breastfeeding promotion.[19]

In 1997, the state of Mississippi was selected as a pilot state in the USDA breastfeeding promotion "Loving Support" campaign. The state's WIC program launched a comprehensive campaign with numerous breastfeeding promotion activities, including orientation for WIC staff and outreach to private health providers. Many WIC clinics responded with efforts to

provide a more supportive environment for breastfeeding mothers, and the state began receiving requests for breastfeeding training. To build on those efforts, the state received a USDA Food and Nutrition Service grant to implement the clinic environment project. The purpose of the project was to promote breastfeeding-friendly clinics through comprehensive staff training and changes in the physical environment. The state partnered with the Center for Community Health at the University of Southern Mississippi to evaluate the effectiveness of the project in improving the breastfeeding knowledge, attitudes, and practices of clinic staff.

In this article, we describe the intervention and report the evaluation results. Although similar interventions had been implemented in other parts of the country, this intervention was unique because it focused on WIC clinic staff and included both clinical and administrative staff. In addition, rigorous evaluations of the effectiveness of such interventions are lacking, and the study results will help fill this gap.

INTERVENTION

In 1997, the Mississippi WIC program issued a request for proposals inviting WIC clinics, including health department clinics and community health centers, to participate in the breastfeeding promotion clinic environment project. The project included staff training and improvements in the physical environments of clinics. Thirteen clinics and one hospital providing WIC services were selected as intervention sites.

To implement the environment change component of the intervention, clinics received mini-grants in order to create private nursing areas and displays of visual images of breastfeeding, such as posters and murals, in key traffic areas. WIC central office staff assisted clinic staff in implementing the changes. The nursing areas were opened in August 1998 as part of August Breastfeeding Awareness Month in Mississippi.

The second component of the intervention was staff training. The training program, "How to Support a Breastfeeding Mother," was developed by the state WIC program following published guidelines.[31] Assessment of staff needs included qualitative and quantitative phases. As part of the USDA national breastfeeding promotion campaign, Best Start Social Marketing researchers conducted focus groups and face-to-face interviews with WIC clinic staff across the state and identified barriers to breastfeeding promotion. In addition, the state WIC program conducted a mail survey of staff members at the 13 intervention clinics, including nurses, nutritionists, clerks, and other administrative staff, to identify common breastfeeding issues and training needs. The staff training program was developed to address the identified barriers and needs. The program was provided as a "train the trainer" event for eight WIC International Board Certified Lactation Consultants (IBCLC), who then presented the training for clinic staff in the summer of 1998.

The training was divided into three levels. The first level was provided to all staff, including administrative and clinical staff. During a 1.5-hour workshop, trainers provided basic information about benefits and barriers to breastfeeding, positive practices and outcomes, and the role of WIC staff in breastfeeding support. Training at the two other levels was provided to health professionals only, including physicians, nurses, and nutritionists. The second level, a three-hour course, provided in-depth information about breastfeeding counseling, support in the early days, and support through problems. The third level delivered three hours of training on special situations, including medical situations of the infant and mother, skills training on breastfeeding devices, and methods for storing human milk.

METHODS

The evaluation assessed the impact of the intervention on breastfeeding knowledge, attitudes/beliefs, and practices of clinic staff. The hypothesis was that the intervention would positively impact knowledge, attitudes, and practices of staff. We decided to include both clinical and administrative staff in the study because they all had an opportunity to promote breastfeeding by developing supportive policies/procedures and through interactions with women. A quasi-experimental study design was used. The 13 intervention clinics were matched with 13 comparison clinics according to clinic size and the following county characteristics: population, percent of population that was non-white, percent of population living in rural areas, median family income, percent of births to unwed women, percent of births to adolescents, and high school graduation rates.[32] The 13 intervention sites were analyzed as one group because the approaches to environmental changes were similar at all sites, including creating private nursing areas and displays of breastfeeding visual images in key traffic areas. The hospital site was excluded from this analysis because of its different setting and lack of an appropriate comparison facility.

The evaluation team conducted one- to two-day site visits to all 26 clinics to collect data. Pre-test data were collected in the spring of 1998, and post-test data in

the spring of 1999. All staff were eligible to participate in the pre-test. However, to be eligible to participate in the post-test, intervention clinic staff must have received the training. The research protocol was approved by the Human Subjects Protection Review Committee of the University of Southern Mississippi.

Staff members completed a self-administered questionnaire at pre- and post-test that collected data on knowledge of benefits and barriers to breastfeeding, attitudes/beliefs, and breastfeeding promotion practice. A comprehensive review of the literature was performed to establish face validity of the questionnaire. Breastfeeding experts, including lactation consultants and WIC program staff, assessed the content validity of the questionnaire. The questionnaire was then pilot tested with 30 staff at two WIC clinics that were not participating in the study.

Study variables

Outcome variables included: (*a*) knowledge of benefits and barriers to breastfeeding, (*b*) attitudes/beliefs, and (*c*) confidence in breastfeeding promotion and practice. Eight survey items addressed each variable. Some statements were worded positively and some negatively. Respondents indicated that each statement was true or false or that they did not know the answer. A "do not know" response was coded as a negative response. Independent variables included demographic characteristics (age and education), position title, number of children, whether the staff person (or partner) had previously breastfed, and, if so, whether the breastfeeding experience was "very good," "good," "okay," "bad," or "very bad."

Statistical methods

Data were analyzed using SPSS Version 11.0 for Windows.[33] Demographic and other characteristics of participants in the intervention and comparison groups were compared using *t*-tests and chi-square tests, as appropriate. Three additive indices were constructed representing breastfeeding knowledge, attitudes/beliefs, and confidence/practice. Participants received 1 point for a response in the desired direction and 0 points for a response in the other direction. (A response in the desired direction was one that was consistent with current thinking about breastfeeding and the importance of clinic support for breastfeeding.) Consequently, each index had a range of scores of 0 to 8, with higher scores indicating more desired responses. The indices were analyzed as continuous variables, and average scores for participants in the intervention and comparison groups before and after the intervention were analyzed using *t*-tests.

RESULTS

Description of the sample

Four hundred and one staff members were approached to complete the pre-test. Of those, 397 participated, including 217 at intervention clinics and 180 at comparison clinics. Only four staff members declined to complete the pre-test. Three hundred and eighty six staff members were asked to complete the post-test. Of those, 277 participated, including 137 at intervention clinics and 140 at comparison clinics. Of the remaining 109 staff, 88 were not eligible to complete the post-test (including 74 intervention clinic staff who had not been trained and 14 comparison clinic staff who had been trained); 20 declined to participate; and one survey was not usable because of missing data.

Table 1 presents background data on staff participating in the pre-test. Intervention and comparison clinic staff had similar characteristics. The average age of respondents was 41 years, and 95% were women. The majority had some college or higher levels of education. Approximately one-third were nurses, another one-third had administrative/clerical positions, and the remaining were nutritionists, social workers, clinical support staff, physicians, and other staff. Eighty-five percent reported having one or more children and 40% reported that they or a partner had previously breastfed any of their children for a week or longer. Sixty-nine percent of staff who reported a previous breastfeeding experience described their experience as "good" or "very good."

Pre-test data

Table 2 describes staff knowledge, attitudes, and practices before and after the intervention by group. Overall, the two groups were similar before the intervention. There were two significant differences, however. Relative to the intervention clinic staff, more comparison clinic staff said that a breastfeeding woman can smoke and that a breastfeeding woman can eat her normal diet.

In terms of knowledge, three in four respondents agreed that breastfeeding protects the baby's health, but only one in three agreed that it could protect the mother's health. In addition, fewer than half of the staff knew that breast milk was the only food that the baby needed during the first 6 months of life. Significant proportions of staff perceived smoking, occasional alcohol drinking, certain foods, and birth control pills as barriers to breastfeeding.

The majority of respondents had positive attitudes/beliefs about breastfeeding before the intervention and indicated that breastfeeding is not painful, em-

Table 1. Self-reported characteristics of clinic staff participating in pre-test (*N* = 397)

	Intervention (n = 217)		*Comparison (n = 180)*		*Total*		
Characteristic	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	p
Gender							
Men	15	7.0	6	3.3	21	5.3	0.108
Women	200	93.0	174	96.7	374	94.7	
Education							
High school diploma or less	31	14.5	22	12.2	53	13.5	0.308
Some college education	68	31.8	55	30.6	123	31.2	
College degree	85	39.7	86	47.8	171	43.4	
Graduate degree	30	14.0	17	9.4	47	11.9	
Job title/function							
Nurse	61	28.2	56	31.3	117	29.5	0.496
Clinical support staff	39	18.1	29	16.1	68	17.2	
Nutritionist/dietitian	12	5.6	17	9.4	29	7.3	
Social worker	13	6.0	13	7.2	26	6.6	
Administrative staff	72	33.3	55	30.6	127	32.1	
Other	19	8.8	10	5.6	29	7.3	
One or more children	167	84.3	152	86.4	319	85.3	0.582
Self or partner breastfed for a week or longer	82	37.8	76	42.2	158	39.8	0.369
Breastfeeding experience positive[a]	51	63.8	57	75.0	108	69.2	0.128
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	
Age in years	40.9	10.03	41.3	10.01	41.1	10.01	0.743

NOTE: *P*-values are for two-sided Pearson chi-square tests. Percentages are calculated based on the number of responses to the specific question.

[a]*n* = 158 respondents who reported they/their partner had breastfed for a week or longer; a positive experience was one described as "good" or "very good."

SD = standard deviation

barrassing, or difficult and would not stop the mother from working or going to school. Respondents further indicated that breastfeeding can be enjoyable for the mother, can make her feel important, and helps in family bonding. In terms of confidence levels, 88% of respondents believed that all staff can be involved in breastfeeding promotion, but half or fewer felt prepared to respond to women's concerns about breastfeeding, able to advise women, and able to actually help them breastfeed. Indeed, 88% of respondents indicated that they would be able to better promote breastfeeding with additional training. When asked about their practice, 56% of staff reported talking about breastfeeding with some or all of their pregnant and postpartum clients at every visit. The figure was higher among clinical staff and lower among administrative/clerical staff.

Effect of the intervention

Post-test results indicate that the intervention had a positive impact on knowledge levels, attitudes/beliefs, and confidence/practice. In terms of knowledge, more intervention clinic than comparison clinic staff indicated that breast milk is the only food that the baby needs during the first 6 months, and that breastfeeding and birth control pills are not contraindicated. Also, significantly higher proportions of staff at the intervention clinics agreed that breastfeeding may protect the mother's health, and that a breastfeeding mother can smoke, have an occasional drink, eat her normal diet, and need not be in excellent health. The percentages of staff reporting that breastfeeding protects the baby's health were similar for the two groups.

The intervention group reported more positive attitudes than the comparison group with regard to three items: breastfeeding can make a woman feel important, breastfeeding is painful, and breastfeeding is a

Table 2. Respondents' knowledge, attitudes, and practices before and after intervention

		Pre-test					*Post-test*				
		Intervention (n = 217)		*Comparison (n = 180)*			*Intervention (n = 137)*		*Comparison (n = 140)*		
Characteristic	*Desired response*	*Number*	*Percent*	*Number*	*Percent*	p	*Number*	*Percent*	*Number*	*Percent*	p
Breastfeeding knowledge											
Protects baby's health	True	162	74.7	139	77.7	0.487	121	89.0	115	82.1	0.107
Protects mother's health	True	64	29.5	58	32.6	0.508	75	55.1	54	38.6	0.006
Sufficient during baby's first 6 months	True	100	46.1	93	52.0	0.245	102	74.5	88	62.9	0.038
Moms who breastfeed must be in excellent health	False	134	61.8	121	67.6	0.227	112	81.8	89	63.6	0.001
Can breastfeed and smoke	True	99	46.0	102	58.0	0.019	106	77.4	76	55.5	<0.001
Can breastfeed and have an occasional drink	True	57	26.3	42	23.9	0.585	90	65.7	41	29.5	<0.001
Can breastfeed and eat different foods	True	66	30.4	73	41.0	0.028	97	70.8	63	45.0	<0.001
Can breastfeed and take birth control pills	True	95	43.8	96	53.3	0.058	92	67.6	78	56.1	0.049
Breastfeeding attitudes/beliefs											
Can be enjoyable for the mother	True	189	87.5	162	90.5	0.345	127	94.1	124	88.6	0.106
Can make a woman feel important	True	163	75.1	143	80.3	0.216	124	91.9	114	81.4	0.011
Stops mother from school or work	False	209	96.3	172	95.6	0.702	134	97.8	137	97.9	1.000
Helps the family bond	True	182	84.7	161	89.4	0.161	128	93.4	124	89.2	0.213
Is painful	False	177	81.6	147	81.7	0.980	126	92.0	118	84.3	0.048
Is embarrassing	False	179	82.9	158	87.8	0.172	131	95.6	127	90.7	0.106
Is a difficult way of feeding infants	False	187	87.4	161	90.4	0.338	130	95.6	123	87.9	0.020
Okay to breastfeed in public	True	185	85.6	162	90.0	0.190	130	94.9	130	92.9	0.481

(continued)

Table 2 (continued). Respondents' knowledge, attitudes, and practices before and after intervention

		Pre-test					*Post-test*				
		Intervention (n = 217)		*Comparison (n = 180)*			*Intervention (n = 137)*		*Comparison (n = 140)*		
Characteristic	*Desired response*	*Number*	*Percent*	*Number*	*Percent*	p	*Number*	*Percent*	*Number*	*Percent*	p
Confidence in breastfeeding promotion and practice											
All staff can promote breastfeeding	True	186	85.7	163	91.1	0.102	135	98.5	125	89.3	0.001
Feel prepared to respond to breastfeeding concerns	True	98	45.4	99	55.3	0.049	106	79.7	74	53.6	<0.001
Confident in ability to advise women about breastfeeding	True	85	39.2	88	48.9	0.052	95	70.4	69	49.3	<0.001
Don't talk about breastfeeding due to lack of knowledge	False	131	60.4	120	66.7	0.195	110	80.9	89	63.6	0.001
Need more breastfeeding training	False	25	11.6	21	11.7	0.977	37	27.6	20	14.3	0.007
Can encourage breastfeeding through work	True	181	83.8	155	86.1	0.522	128	93.4	116	82.9	0.007
Able to help women breastfeed	True	107	49.3	95	52.8	0.491	96	70.6	76	54.3	0.005
Talk about breastfeeding with pregnant/postpartum women	True	109	51.4	109	60.9	0.060	104	76.5	79	56.8	0.001

NOTE: *P*-values are for two-sided Pearson chi-square tests, between-group comparisons. Percentages are calculated based on the number of responses to the specific question.

difficult way of feeding infants. In addition, confidence levels and practices of the intervention group were significantly more positive than those of the comparison group with regard to all eight items. Among intervention clinic staff, 93% indicated that they could encourage breastfeeding through their work (compared with 83% of comparison clinic staff), and 71% indicated that they were able to help women breastfeed (compared with 54% of comparison clinic staff). Higher percentages of intervention clinic than of comparison clinic staff felt prepared to respond to breastfeeding concerns and able to advise women about breastfeeding. Finally, fewer intervention clinic staff reported not talking about breastfeeding due to lack of knowledge (19% vs. 36%; p=0.001) and more were promoting breastfeeding to some or all clients on a daily basis (77% vs. 57%; p=0.001).

Table 3 lists the composite index scores. Each index had a range of scores of 0 to 8, with higher scores indicating a higher number of responses in the desired direction. At the time of the pre-test, the two groups had similar mean scores on all indices. Mean scores for all participants were 3.78 (standard deviation [SD] = 2.16) for the knowledge index, 6.94 (SD = 1.63) for the attitude/belief index, and 4.49 (SD = 2.24) for the confidence/practice index. At the time of the post-test, the intervention group scored higher than the comparison group on each of the three indices. The difference between intervention and comparison clinic scores was higher for the knowledge and confidence/practice indices (p<0.001) than for the attitude/belief index (p=0.004).

Mean scores were also examined for different categories of health care workers. Administrative/clerical staff appeared to have benefited the most from the intervention. Pre-test data indicated that mean scores for administrative staff were 2.70 (SD = 1.64) for the knowledge index and 3.65 (SD = 2.03) for the confidence/practice index. The intervention and comparison groups were similar at baseline. Following the project, administrative staff at the intervention clinics had higher knowledge and confidence/practice scores than the administrative staff at the comparison clinics: 5.10 (SD = 2.29) vs. 3.28 (SD = 1.78) for the knowledge index and 5.10 (SD = 1.82) versus 3.22 (SD = 1.90) for the confidence/practice index.

DISCUSSION

This study showed that the intervention had a significant impact on breastfeeding knowledge, attitudes/beliefs and practices of staff in public health settings. The intervention and comparison groups were overall similar at baseline. Following the project, the intervention group reported higher levels of knowledge and more positive attitudes/beliefs and promotion practices than the comparison group. We conclude that clinic environment projects, which combine physical improvements and staff training, are effective in breastfeeding promotion among public health clinic staff and may contribute to the overall effectiveness of breastfeeding promotion programs.

The results have the following practice implications. First, future interventions should include both administrative and clinical staff, particularly administrative staff who are responsible for policies/procedures (e.g., administrators) and who have regular contacts with clients (e.g., WIC certification clerks). Second, although staff attitudes/beliefs were highly positive at baseline, knowledge and confidence/practice scores were not. Future interventions should focus on providing state-of-the-art facts about the benefits of breastfeeding, particularly to the mother's health, and perceived dietary barriers to breastfeeding, as well as increasing the confidence of staff in their ability to promote breastfeeding to clients.

Table 3. Knowledge, attitude, and self-efficacy/practice indices before and after intervention

	Pre-test					*Post-test*				
	Intervention (n = 217)		*Comparison (n = 180)*			*Intervention (n = 137)*		*Comparison (n = 140)*		
Index	*Mean*	*SD*	*Mean*	*SD*	p	*Mean*	*SD*	*Mean*	*SD*	p
Breastfeeding knowledge	3.60	2.18	4.00	2.12	0.071	5.84	1.92	4.38	2.32	<0.001
Breastfeeding attitudes/beliefs	6.86	1.67	7.05	1.59	0.246	7.59	0.86	7.15	1.5	0.004
Confidence in breastfeeding promotion and practice	4.29	2.18	4.72	2.30	0.059	6.02	1.85	4.63	2.50	<0.001

NOTE: P values are for two-sided *t*-tests, between-group comparisons. The range of scores for each index was 0 to 8, with a higher score indicating a higher number of responses.

The finding that the administrative staff appeared to have benefited the most from the intervention is worth noting. It is possible that this finding was driven by the lower levels of knowledge and confidence among administrative staff relative to clinical staff at baseline. Further research into the impact of clinic environment projects on different categories of health care workers is needed. Research is also needed to identify ways to integrate training into the continuing education of health care workers, as well as to identify resources for improving the breastfeeding friendliness of public health clinics.

The study findings were limited in two ways. First, clinics applied to participate in the intervention, signaling their readiness for training and change. It is possible that the level of improvement in outcome variables would have been different had the clinics been randomly selected to receive the intervention. Second, convenience samples of all eligible staff were surveyed before and after the intervention. A design that allows for matching staff in the pre- and post-intervention samples, as well as in the pre- and post-comparison samples would have been stronger. This design was not used in order to avoid identification of staff and possibly a low response rate.

Since the completion of the evaluation, the Mississippi WIC program has used "How to Support a Breastfeeding Mother" to train more than 1,000 hospital and clinic staff. The training is part of the larger ongoing "Loving Support" breastfeeding promotion program that the state began in 1997. A separate evaluation of the campaign found increases in breastfeeding rates among low-income women across the state.[34] Information about the training protocol and other campaign activities are available from the Mississippi WIC program.

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