

# Evaluation of an instructional program on Primigravida women's knowledge about exclusive breastfeeding

Aljbory BSF<sup>1</sup>[ID](#), Witwit SJH<sup>2</sup>[ID](#)

<sup>1</sup>Department of Maternity and Neonate Nursing, College of Nursing, University of Babylon, Iraq

<sup>2</sup>Department of Gynaecology and Obstetrics, F. I. B. O. G., College of Medicine, University of Babylon, Iraq

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## Abstract

**Objective:** To evaluate the effectiveness of an instructional program on improving knowledge about exclusive breastfeeding (EBF) among primigravida women in primary healthcare centres.

**Methods:** A quasi-experimental study (one-group pretest-post-test design) was conducted from October 1, 2024, to January 1, 2025. A purposive sample of 60 primigravida women attending a primary health centre in Iraq was recruited. Participants completed a validated questionnaire assessing EBF knowledge before and after a structured instructional program. The program consisted of a single 45-minute session using lectures and visual aids. Data were analysed using descriptive statistics and a paired samples t-test.

**Results:** A significant improvement in mean knowledge scores was observed post-intervention ( $67.4 \pm 3.4$ ) compared to pre-intervention ( $42.1 \pm 8.7$ ), with a mean difference of 25.3 points ( $t(59) = 25.12, p < 0.001$ ). High post-test knowledge was noted regarding the definition of EBF (95%), the sufficiency of breastmilk (95%), and the initiation of breastfeeding (88.3%). However, knowledge regarding EBF's protective effects against sudden infant death syndrome (46.7% "I know") and acute otitis media (50% "I know") remained moderate. No significant associations were found between post-test knowledge scores and demographic characteristics (age, education, occupation, residence;  $p > 0.05$ ).

**Conclusion:** The instructional program significantly improved knowledge of EBF among primigravida women. Integrating such structured educational sessions into routine antenatal care at primary health centres is recommended to promote EBF practices.

**Keywords:** Exclusive breastfeeding, primigravida, knowledge, instructional program, health education, Iraq

## Plain English Summary

Breastfeeding only breast milk for the first six months (exclusive breastfeeding) is highly beneficial for both infant and maternal health. This study tested an educational program for first-time pregnant women in Iraq to teach them about exclusive breastfeeding. The women answered questions before and after a single teaching session. The results showed that their knowledge improved significantly after the program. They learned key facts, such as starting breastfeeding within the first hour after birth and giving only breast milk for six months. The study suggests that offering such programs in local health centres could help more mothers successfully breastfeed.

## Introduction

Exclusive breastfeeding (EBF) for the first six months of life is a cornerstone of infant and child health, protecting against infectious diseases, malnutrition, and chronic conditions later in life (1, 2). Despite its recognised benefits, global EBF rates remain below World Health Organisation targets, with first-time mothers (primigravida) being a particularly vulnerable group due to their lack of experience and often insufficient knowledge (3, 4). In Iraq, as in many regions, cultural practices, misinformation, and inadequate support can hinder the initiation and duration of EBF (5). Prenatal education is a critical predictor of successful breastfeeding outcomes, as it helps shape intentions and prepares women for the practical challenges of nursing (6, 7). While the benefits of EBF are well-documented in the literature (8), there is a need for evidence on the effectiveness of

localised, practical educational interventions delivered within existing primary healthcare systems in low- and middle-income settings, such as the Iraqi context (9, 10).

This study aimed to develop, implement, and evaluate a structured instructional program designed to improve knowledge regarding EBF among primigravida women attending a primary healthcare centre in Iraq.

## Materials and Methods

### Study Design

A quasi-experimental study employing a one-group pretest-post-test design was conducted between October 1, 2024, and January 1, 2025.

### Setting and Sample

The study was conducted at a primary healthcare centre in Babylon, Iraq. A purposive (non-

Correspondence:

Aljbory Balqees SF

Department of Maternity and Neonate Nursing, College of Nursing

University of Babylon

Iraq

+9647819730337; [nur882.balkess.salman@student.uobabylon.edu.iq](mailto:nur882.balkess.salman@student.uobabylon.edu.iq)

probability) sample of primigravida women attending the antenatal care centre was recruited. The initial sample included 70 women; ten participated in a pilot study to test the instrument and were excluded from the main analysis. The final sample consisted of 60 primigravida women who provided informed consent.

#### The Instructional Program

The program was developed based on a review of scientific literature and WHO guidelines on EBF. Content validity was established by a panel of five experts in obstetrics, paediatrics, and nursing. The finalised program was a single, structured session lasting approximately 45 minutes, delivered by the principal researcher. The session employed a lecture format supported by flip charts and pamphlets, covering:

1. Anatomy and physiology of breastfeeding
2. Definition and importance of EBF
3. Benefits of EBF for the infant and mother
4. Practical aspects: initiation, positioning, latching, and duration
5. Addressing common myths and barriers

#### Study Instrument

A structured, self-administered questionnaire was used for data collection, translated into Arabic and validated for clarity and content.

Part 1: Demographic data (age, education, occupation, residence).

Part 2: General knowledge of EBF (17 multiple-choice questions).

Part 3: Knowledge of EBF benefits for the infant (10 items on a 3-point scale: I know, I am not sure, I don't know).

Part 4: Knowledge of EBF benefits for the mother (10 items on the same 3-point scale). The instrument's reliability was confirmed using Spearman's rho correlation, which showed good internal consistency ( $\alpha = 0.82$ ).

#### Data Collection

The pre-test was administered immediately before the instructional session. The post-test was

conducted using the same questionnaire two weeks after the intervention to assess knowledge retention.

#### Data Analysis

Data were analysed using SPSS version 26. Descriptive statistics (frequency, percentage, mean, and standard deviation) summarised the data. Inferential statistics included a paired samples t-test to compare pre- and post-test knowledge scores and a one-way ANOVA to test the association between demographic variables and the total knowledge score. A p-value of  $< 0.05$  was considered statistically significant.

#### Results

##### General Knowledge of Exclusive Breastfeeding

The general knowledge of participants regarding exclusive breastfeeding showed a substantial improvement following the instructional program. The overall mean knowledge score increased from  $42.1 \pm 8.7$  in the pre-test to  $67.4 \pm 3.4$  in the post-test. This mean difference of 25.3 points was statistically significant ( $t(59) = 25.12, p < 0.001$ ), indicating a powerful effect of the intervention.

As detailed in Table 1, post-test results revealed high levels of understanding on several critical items. Most participants correctly identified the definition of exclusive breastfeeding as 'breast milk only' (95%,  $n=57$ ) and acknowledged that breast milk alone is sufficient for an infant under six months (95%,  $n=57$ ). Knowledge regarding the initiation of breastfeeding was also markedly high, with 88.3% ( $n=53$ ) correctly identifying that it should begin within the first hour after birth. Furthermore, all participants (100%,  $n=60$ ) correctly identified breast milk as the only recommended food or liquid for a child under six months. The understanding of the comprehensive importance of EBF, encompassing development, disease protection, and long-term health benefits, also saw a dramatic rise to 80% ( $n=48$ ) from a pre-test score of 16.7%.

**Table 1: Pre- and Post-Test Comparison of General Knowledge on Exclusive Breastfeeding (n=60)**

Knowledge Question	Correct Answer	Pre-Test Correct n (%)	Post-Test Correct n (%)
An adult woman's breasts are	Tear-shaped glands that produce milk	15 (25.0)	49 (81.7)
Hormone for milk production	Prolactin	18 (30.0)	49 (81.7)
Colostrum is	Rich in beneficial substances	20 (33.3)	57 (95.0)
Definition of EBF	Breast milk only	22 (36.7)	57 (95.0)
Importance of EBF	All the above (dev., protection, LT benefits)	10 (16.7)	48 (80.0)
Recommended for child <6mo	Breast milk only	25 (41.7)	60 (100.0)
Breast milk alone is enough	Sufficient for infants under six months	24 (40.0)	57 (95.0)
Duration of EBF	About 6 months	19 (31.7)	52 (86.7)
Time to initiate breastfeeding	Within one hour after birth	20 (33.3)	53 (88.3)

#### Knowledge of EBF Benefits for the Child

Table 2 presents the participants' knowledge of the benefits of exclusive breastfeeding for the child after the program. The results indicate a high level of awareness ( $>80\%$ ) for most benefits. For instance, 96.7% ( $n=58$ ) of women knew that breastfeeding reduces the severity and duration of diseases, 93.3% ( $n=56$ ) recognised its positive impact on dental health, and 86.7% ( $n=52$ ) were aware of its protective effects against severe lower respiratory diseases and gastrointestinal infections.

However, the results also identify specific areas where knowledge, while improved, was not as comprehensive. Only half of the participants (50.0%,  $n = 30$ ) were confident that EBF protects against acute otitis media (ear infections), while the remaining half were unsure. Similarly, knowledge regarding the protection against sudden infant death syndrome (SIDS) was the lowest among the listed benefits, with only 46.7% ( $n=28$ ) stating they knew this fact, while 53.3% ( $n=32$ ) remained unsure.

**Table 2: Knowledge of EBF Benefits for the Child Post-Intervention (n=60)**

Benefit for the Child	I know n (%)	I am not sure n (%)	I don't know n (%)
Includes antibodies	47 (78.3)	13 (21.7)	0 (0.0)
Shields from contagious diseases	51 (85.0)	9 (15.0)	0 (0.0)
Prevents chronic illnesses (diabetes, asthma)	50 (83.3)	10 (16.7)	0 (0.0)
Protects from severe respiratory diseases	52 (86.7)	8 (13.3)	0 (0.0)
Protects from acute otitis media	30 (50.0)	30 (50.0)	0 (0.0)
Protects from sudden infant death syndrome	28 (46.7)	32 (53.3)	0 (0.0)
Protects from gastrointestinal infections	52 (86.7)	8 (13.3)	0 (0.0)
Improves dental health	56 (93.3)	4 (6.7)	0 (0.0)
Reduces the severity/duration of diseases	58 (96.7)	2 (3.3)	0 (0.0)
Protects from allergies	49 (81.7)	11 (18.3)	0 (0.0)

**Knowledge of EBF Benefits for the mother**

The instructional program was also effective in educating primigravida women about the maternal benefits of exclusive breastfeeding, as shown in Table 3. Over 90% of participants were aware that breastfeeding stimulates milk production (95.0%, n=57) and acts as a birth control method (93.3%, n=56). A high percentage were also knowledgeable about the reduced risk of breast cancer (90.0%, n=54) and the potential for an early return to pre-pregnancy weight (85.0%, n=51).

Areas of relative uncertainty persisted for benefits that are longer-term or more complex. Only 61.7% (n=37) of women knew that breastfeeding helps the uterus return to its pre-pregnancy size faster due to oxytocin. Crucially, knowledge of the protective effect against hip fractures and osteoporosis in the post-menopausal stage was the lowest, with only half of the participants (50.0%, n=30) confident in this benefit and the other half unsure.

**Table 3: Knowledge of EBF Benefits for the Mother Post-Intervention (n=60)**

Benefit for the mother	I know n (%)	I am not sure n (%)	I don't know n (%)
Stimulates milk production	57 (95.0)	3 (5.0)	0 (0.0)
Reduces postpartum haemorrhage	44 (73.3)	16 (26.7)	0 (0.0)
Promotes faster uterine involution	37 (61.7)	22 (36.7)	1 (1.7)
Acts as a birth control method	56 (93.3)	4 (6.7)	0 (0.0)
Reduces risk of hip fractures/osteoporosis	30 (50.0)	30 (50.0)	0 (0.0)

**Association Between Knowledge Scores and Demographic Characteristics**

Table 4 summarises the relationship between the participants' post-test total knowledge scores and their demographic characteristics. A one-way ANOVA test revealed that there were no statistically significant differences in mean knowledge scores across any of the demographic variables assessed. This includes age groups (p = 0.130), educational level (p = 0.065), occupational

status (p = 0.052), and place of residence (p = 0.519). Although slight variations in mean scores are visible (e.g., government employees scored slightly higher), these differences were not statistically significant. This indicates that the instructional program was effective in improving knowledge uniformly, regardless of the primigravida women's age, education, occupation, or residency.

**Table 4: Association Between Demographic Characteristics and Total Post-Test Knowledge Score (One-Way ANOVA)**

Characteristic	Categories	Mean Score ± SD	P-value
Age groups (years)	20-22	65.8 ± 3.6	0.13
	23-25	67.1 ± 3.5	
	26-28	68.8 ± 2.4	
	29-31	70.0 ± 2.0	
	32-34	69.0 ± 0.0	
Educational level	Primary	65.4 ± 3.2	0.065
	Secondary	67.3 ± 2.7	
	College and above	67.9 ± 4.3	
Occupational status	Government employee	70.8 ± 2.2	0.052
	Non-government employee	71.0 ± 0.0	
	Student	66.9 ± 3.7	
	Housewife	66.2 ± 3.3	
Residence	Urban	67.3 ± 3.2	0.519
	Rural	66.6 ± 4.1	
	Surroundings	65.9 ± 3.2	

**Discussion**

This study demonstrates that a single, structured instructional program can significantly improve knowledge about exclusive breastfeeding among primigravida women. The statistically significant increase in mean knowledge scores (p < 0.001) aligns with findings from similar studies in India (11,

12), confirming that targeted education is a powerful tool for empowering first-time mothers.

The post-intervention results revealed excellent knowledge regarding the practical aspects of EBF, such as its definition, initiation time, and duration. This suggests the program was effective in conveying core, actionable information. However,

knowledge regarding specific protective benefits, notably against sudden infant death syndrome (SIDS) and acute otitis media, remained suboptimal. This may be because these concepts are more complex and less emphasised in common health messaging compared to the direct benefits of nutrition and immunity. Future programs should dedicate specific focus to these important protective effects.

The finding that demographic factors (age, education, occupation, residence) showed no significant association with post-test knowledge scores is particularly noteworthy. This implies that the instructional program was effective across diverse sociodemographic groups. This finding, supported by a study from Ghana (13), suggests that a standardised educational approach can mitigate pre-existing knowledge gaps related to education or background, making it an equitable intervention for wide implementation in primary care settings.

A primary limitation of this study is its one-group pretest-post-test design, which lacks a control group. Therefore, while we can attribute the knowledge gain to the intervention, we cannot entirely rule out the influence of external factors. Future research should employ a randomised controlled trial design to establish stronger causality. Another limitation of this study is the short follow-up period (two weeks), which restricts our ability to assess the long-term retention of knowledge or its translation into sustained exclusive breastfeeding practices. Future studies should therefore include longer follow-up intervals to capture these outcomes.

### Conclusion

The instructional program proved highly effective in enhancing primigravida women's knowledge of exclusive breastfeeding. The program's success across different demographic groups supports its potential for broad application. We recommend that the Iraqi Ministry of Health and health service providers integrate such evidence-based, structured educational programs into routine antenatal care services at primary health centres to improve EBF rates and subsequent child health outcomes.

### List of Abbreviations

EBF: Exclusive Breastfeeding  
SD: Standard Deviation  
SIDS: Sudden Infant Death Syndrome  
WHO: World Health Organisation

### Declarations

#### *Ethics approval and consent to participate*

This study was performed in line with the principles of the Declaration of Helsinki. Ethical approval was granted by the College of Nursing, University of Babylon Ethics Committee (Approval No. 41, dated 18-9-2024). Written informed consent was obtained from all individual participants included in the study. The consent form detailed the study's purpose, procedures, potential benefits, and the assurance of confidentiality and anonymity. Participants were informed that their participation was entirely voluntary and that they could withdraw from the study at any time without any penalty or impact on their medical care. Participants signed informed consent regarding publishing their anonymised data.

#### *Consent for publication*

The author gave consent for the publication of the work under the Creative Commons Attribution-Non-Commercial 4.0 license.

#### *Availability of data and materials*

The data and materials associated with this research will be made available by the corresponding author upon reasonable request.

#### *Competing interests*

The authors declare no competing interests.

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#### *Authors' contributions*

ABSF: Conceptualisation, Methodology, Investigation, Data Curation, Formal Analysis, Project Administration, Writing – Original Draft Preparation, Writing – Review & Editing.  
WSJH: Supervision, Validation, Resources, Writing – Review & Editing, Visualisation.

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