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Health policy for the protection, promotion and support of breastfeeding in hospital settings

Dissertation Summary

for the acquisition of the educational and scientific degree
"Doctor"
in the scientific specialty
"Social Medicine and Health Management"

SCIENTIFIC SUPERVISORS:
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The dissertation is 209 pages long, including an introduction, literature review, research methodology, results discussion, conclusions, recommendations and scientific contributions. The bibliography includes 173 literary sources. The work is illustrated with 10 tables, 40 figures and 4 appendices. The numbers of the figures and tables included in the dissertation summary do not correspond to the exact sequence in the dissertation.

The dissertation is discussed and approved by the Scientific Collegium of the Health Promotion and Disease Prevention Directorate at the National Center of Public Health and Analyses and is proposed for a public defence before a scientific jury in the professional field 7.1. "Medicine".

СЪДЪРЖАНИЕ

LIST OF ABBREVIATIONS

- **BFHI** – Baby-Friendly Hospital Initiative
- **CG** – Control Group
- **EG** – Experimental Group
- **EBF** – Exclusive Breastfeeding
- **IBCLC** – International Board Certified Lactation Consultant
- **MoH** – Ministry of Health
- **NABS** – National Association for Breastfeeding Support
- **NBC** – National Breastfeeding Committee
- **NPIMCH** – National Programme for Improving Maternal and Child Health
- **NPPCND** – National Programme for the Prevention of Chronic Non-communicable Diseases
- **NCPHA** – National Center of Public Health and Analyses
- **WHO** – World Health Organization

INTRODUCTION

Breastfeeding is a topic of considerable public interest, and its health, personal, social, economic, and environmental benefits are widely recognised in both public and scientific debate.

1. Historical context and global trends in breastfeeding

Breastfeeding is the biological norm for feeding the human new-born and, throughout most of human history, has been the primary and universal method of infant feeding. A marked decline in both the prevalence and duration of breastfeeding began in the early 20th century in industrialised societies as a result of urbanization, the introduction of breastfeeding substitutes, changes in women's participation in the labour market, and aggressive marketing by infant formula manufacturers. By the 1970s, breastfeeding rates had reached their lowest levels globally, especially in high-income countries.

Since the late 20th century, a reversal of this trend has been observed, associated with the growing scientific evidence on the benefits of breastfeeding and the development of international policies aimed at supporting breastfeeding. Nevertheless, global rates of exclusive breastfeeding remain suboptimal, with less than 40% of infants under 6 months of age being exclusively breastfed in many countries.

2. Scientifically established benefits of breastfeeding

Scientific research has demonstrated a wide range of short- and long-term benefits for the child, the mother, and society. For the child, breastfeeding reduces the risk of gastrointestinal, respiratory, and ear infections, as well as sudden infant death syndrome. In the long term, breastfeeding is associated with a lower risk of obesity, type 2 diabetes, certain allergic conditions and childhood leukaemia.

For mothers, breastfeeding has a protective effect against breast and ovarian cancer, cardiovascular disease and osteoporosis. Beyond its health benefits, breastfeeding is highly cost-effective and contributes to reducing the environmental footprint of infant feeding.
The accumulation and widespread dissemination of scientific evidence have been key drivers in the development and advancement of global policies to promote, support, and protect breastfeeding.

3. Factors influencing breastfeeding success

Breastfeeding outcomes are shaped by a complex interplay of biological, social, and system-level factors.

Maternal age, level of education, previous breastfeeding experience, reproductive difficulties, endocrine disorders (e.g., thyroid dysfunction, diabetes, polycystic ovary syndrome), and mode of birth are associated with significant variation in the likelihood of exclusive breastfeeding. Caesarean birth and certain health conditions may complicate the establishment of early lactation and adversely affect early outcomes.

Pre-existing attitudes, motivation to breastfeed, support from partners and family, as well as access to adequate information and antenatal preparation are among the key predictors of breastfeeding duration.

A substantial body of evidence highlights the critical role of hospital practices during the first hours and days following birth—early initiation of breastfeeding, skin-to-skin contact immediately after birth, 24-hour rooming-in, avoiding of routine supplementation, adequate staff training, and sustained post-discharge support. Numerous studies demonstrate a direct association between the implementation of these practices and higher rates of exclusive breastfeeding.

4. International standards and policies supporting breastfeeding

Since the 1980s, the international community has developed a series of coherent policy frameworks aimed at protecting breastfeeding and improving the quality of perinatal care.

Key documents include:

- **The International Code of Marketing of Breastmilk Substitutes (1981)** – fundamental to the regulation of commercial practices;
- **The Innocenti Declaration (1990)** – outlining governments responsibilities for national coordination, legislation, and hospital standards;
- **The Baby-Friendly Hospital Initiative (1991)** – establishing the *10 Steps to Successful Breastfeeding* as the global gold standard;
- **The Global Strategy for Infant and Young Child Feeding (2002)** – consolidating the principles of exclusive breastfeeding for 6 months and continued breastfeeding for 2 years and beyond.

The effective implementation of these policies at the national level has been shown to improve key indicators, including: early initiation of breastfeeding, exclusive breastfeeding in the early period, and continued breastfeeding until the second year.

5. Breastfeeding prevalence in Europe and Bulgaria

The European region continues to have some of the lowest levels of exclusive breastfeeding globally. Although a large proportion of mothers initiate breastfeeding, exclusive breastfeeding up to 6 months remains below 25% on average across the region.

In Bulgaria, the trends are similar and even more unfavourable. While most mothers begin breastfeeding, early initiation (within the first hour) and exclusive breastfeeding during the first months remain considerably below the averages reported by upper-middle income countries. The main challenges relate to the incomplete implementation of evidence-based clinical practices and hospital standards, the limited coverage of the Baby-Friendly Hospital Initiative (BFHI), insufficient continued breastfeeding support, and the absence of a national policy framework ensuring long-term sustainability.

These characteristics highlight the need for in-depth examination of hospital practices and support-related factors within the Bulgarian context— forming the scientific and applied focus of this dissertation.

METHODOLOGY

1. Objective

To analyse health policy related to breastfeeding and to assess the applicability of a health policy model for the protection, promotion and support of breastfeeding in hospital healthcare facilities in Bulgaria, with a view to developing a national model for the protection, promotion and support of breastfeeding.

2. Tasks

1. To conduct a comparative analysis of the national health policy for the protection, promotion and support of breastfeeding in Bulgaria with international health policies and practices in the field.
2. To analyse the effect of the implementation of good practices for specialised breastfeeding support to mothers in hospital healthcare facilities.
3. To identify the main factors contributing to the implementation of good breastfeeding practices.
4. To develop a proposal for a system of measures to be incorporated into a new national health policy model for the protection, promotion and support of breastfeeding.

3. Hypotheses

1. The national health policy for the protection, promotion and support of breastfeeding in Bulgaria corresponds to international health policies and practices in this field to a limited extent.
2. The implementation of a set of clinical practices aligned with those defined within the Baby-Friendly Hospital Initiative (BFHI), aimed at supporting breastfeeding around the time of birth and during the first month postpartum, leads to improved breastfeeding indicators at the end of the first and the sixth months.

4. Material

The dissertation analyses publications and documents presenting good international models of policies and practices in the field of breastfeeding, as well as Bulgarian policies and practices over the recent decades.

The prospective quasi-experimental controlled study conducted as part of the dissertation examines the implementation and effects of a set of good practices for specialised support for mothers with regard to breastfeeding during the hospital stay and in the first months after childbirth. The study includes mothers with a first or subsequent birth of healthy full-term infants, regardless of the mode of delivery.

5. Methods

1. Sociological methods

1.1. Documentary method

The documentary method is used for the systematic review and assessment of regulatory documents, strategic policies, and official guidelines of international and national health institutions (WHO, UNICEF, *"Protection, Promotion and Support of Breastfeeding in Europe: a Blueprint for Action"*, national regulations, and programmes).

On the basis of this review, a comparative analysis is conducted between the existing national policies in Bulgaria and the measures set out in the *"Protection, Promotion and Support of Breastfeeding in Europe: a Blueprint for Action"*.

1.2. Survey (structured telephone interviews)

To examine the effect of the implementation of good hospital practices based on the BFHI programme, a set of three questionnaires is developed and administered at three time points:

1. immediately after discharge;
2. after the 30th day;
3. 180 days after birth.

The method represents a quantitative prospective observation of the same participants over time.

2. Experimental method

The experimental method is used to assess the effect of applying a set of good hospital practices to support breastfeeding. A study is conducted to examine the effect of applying good practices for protecting, supporting, and promoting breastfeeding in hospital healthcare facilities.

3. Statistical methods for data analysis

- Alternative analysis – categorical variables are presented as absolute numbers and relative proportions.
- Variation analysis – quantitative variables are presented as mean values and standard deviations or as medians in cases of non-normal data distribution.
- Correlation analysis – is used to describe the strength and direction of the relationship between variables.
- Analysis of variance – is used to establish statistically significant differences between mean values in more than two groups.
- Regression analysis – logistic regression is used to identify factors associated with the probability of exclusive breastfeeding by calculating odds ratios (OR) and 95% confidence intervals.

Tables (simple and multivariate) and figures are used to present and illustrate the data and the results obtained, according to the type of variables and their measurement scale.

Statistical significance is accepted at a significance level of $p < 0.05$.

6. Sample characteristics and organization of the empirical study

The study examining the effect of applying good practices for the protection, promotion and support of breastfeeding in hospital healthcare facilities is conducted between February 2022 and May 2023. It is approved by a decision of the Medical Ethics Committee of the National Center for Public Health and Analyses on 26 January 2022.

The questionnaires developed for the structured telephone interviews are initially piloted with representatives of the target group of the study. Several technical issues are identified and resolved, and participants' feedback is taken into account.

The actual study is implemented in three phases, and the structured telephone interviews are conducted at the planned time points: the first interview shortly after the mothers' discharge from the maternity ward, the second after the infant reaches one month of age, and the third six months after birth.

All three structured telephone interviews (after birth, at one month, and at six months) are conducted by the doctoral candidate. The participants are divided into two groups: experimental (EG) and control group (CG).

The following inclusion criteria are defined:

- gestational age at birth of at least 36 completed weeks;
- birth weight of at least 2,500 g.

All mothers who provide verbal consent receive an informed consent form containing brief information about the objectives of the study and the nature of their participation.

The consent form is initially signed by 289 mothers. Of these, 15 do not meet the inclusion criteria (gestational age and birth weight), 4 provide incomplete or incorrect telephone numbers, and 24 do not respond to telephone calls for the first interview.

A total of 246 mothers is included in the final sample. By the end of the study, 232 participants remained in the study – 118 in the experimental group and 114 in the control group. The total number of interviews is 715 (246 first, 237 second, and 232 third interviews) all of which are conducted by the doctoral candidate. (Fig. 1)
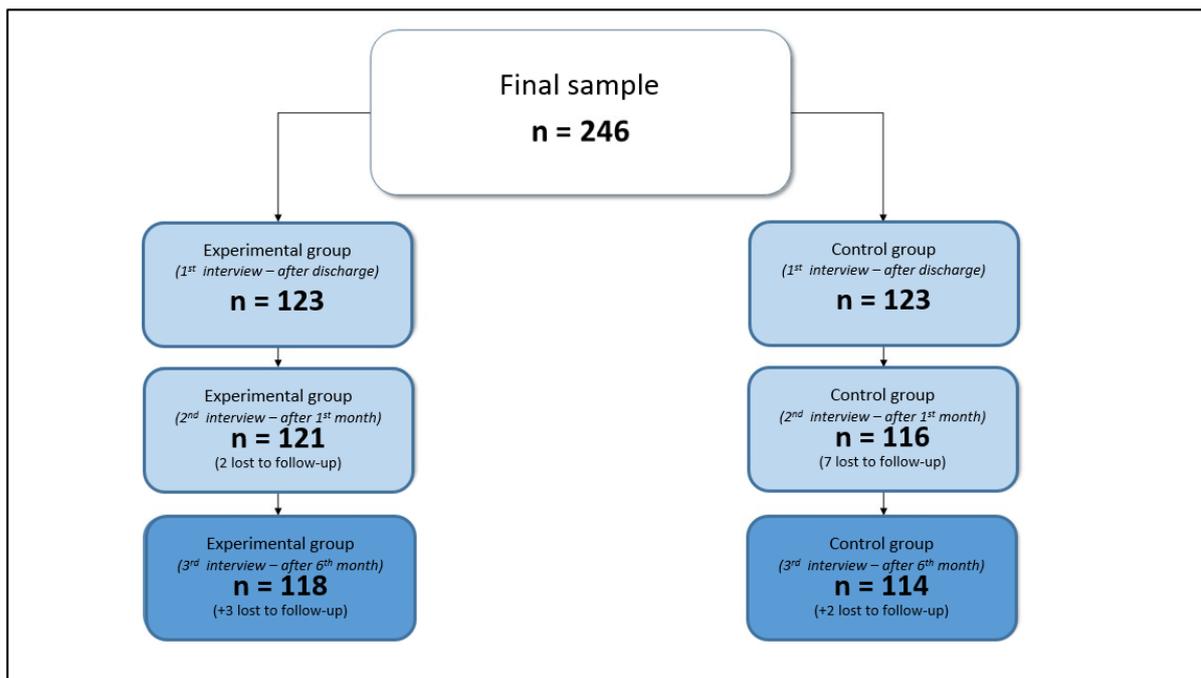
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                          ┌─────────────────────────┐
                          │      Final sample       │
                          │        n = 246          │
                          └─────────────────────────┘
          ┌───────────────────────────┴───────────────────────────┐
┌─────────────────────────────┐                       ┌─────────────────────────────┐
│    Experimental group       │                       │       Control group         │
│ (1st interview – after      │                       │ (1st interview – after      │
│        discharge)           │                       │        discharge)           │
│        n = 123              │                       │        n = 123              │
└─────────────────────────────┘                       └─────────────────────────────┘
              │                                                       │
┌─────────────────────────────┐                       ┌─────────────────────────────┐
│    Experimental group       │                       │       Control group         │
│ (2nd interview – after 1st  │                       │ (2nd interview – after 1st  │
│        month)               │                       │        month)               │
│        n = 121              │                       │        n = 116              │
│    (2 lost to follow-up)    │                       │    (7 lost to follow-up)    │
└─────────────────────────────┘                       └─────────────────────────────┘
              │                                                       │
┌─────────────────────────────┐                       ┌─────────────────────────────┐
│    Experimental group       │                       │       Control group         │
│ (3rd interview – after 6th  │                       │ (3rd interview – after 6th  │
│        month)               │                       │        month)               │
│        n = 118              │                       │        n = 114              │
│   (+3 lost to follow-up)    │                       │   (+2 lost to follow-up)    │
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Figure 1. Distribution and follow-up of participants by group and interview stage

The reasons for dropout during the study are largely unknown, as mothers stop responding to telephone calls. Participants in the experimental group (EG) are recruited with the support of:

- two midwifery practices affiliated with private hospitals – the Zebra midwifery practice at St. Sofia Hospital, Sofia, and the *La Vita Nova* midwifery practice at *St. Lazar Hospital*, Sofia;
- a paediatrician-neonatologist, IBCLC, and a midwife who has completed 45-hour UNICEF breastfeeding support training programme, at *Maichin Dom University Hospital of Obstetrics and Gynaecology,* Sofia;
- a midwife, IBCLC, from the *G. Stranski University Hospital*, Pleven;
- a midwife from *St. Anna Hospital*, Varna, who has completed 45 hours of UNICEF training in breastfeeding support.

The majority of participants in the experimental group are recruited through the two midwifery practices in which the breastfeeding support model is implemented most comprehensively and which receive institutional support from the respective hospitals.

Participants in the control group are recruited through professionals from both outpatient care (follow-up obstetricians–gynaecologists and physicians from other specialties) and hospital care (midwives and a clinical psychologist). The group includes mothers who have used the services of state and municipal hospitals (First Specialised Hospital of Obstetrics and Gynaecology *St Sofia*, Sofia; Second Specialised Hospital of Obstetrics and Gynaecology *Sheynovo*, Sofia; *Maichin Dom University Hospital of Obstetrics and Gynaecology*, Sofia; *G. Stranski University Hospital*, Pleven; *St Rilski Hospital*, Dupnitsa, among others), as well as private hospitals (*Tokuda University Hospital*, Sofia; *Maichin Dom Hospital*, Varna; *Avis Medica Hospital*, Pleven, among others).

A controlled intervention (specific counselling and assistance related to breastfeeding) is implemented during the postnatal hospital stay after birth. Mothers are supported in positioning the baby at the breast, organising breastfeeding in a way that meets the infant's needs while ensuring optimal establishment of lactation, expressing breast milk (manually or using a pump), maintaining lactation in cases of separation, and identifying sources of support after discharge, etc.

Counselling in the postnatal ward is provided by healthcare professionals (midwives and a physician) who are International Board Certified Lactation Consultants (IBCLCs)[1] or have completed comprehensive IBCLC-led specialised training in breastfeeding counselling (a 45-hour based on UNICEF programme breastfeeding support course). During the first month after birth—the most sensitive period for lactation establishment—mothers are offered follow-up and additional breastfeeding support.

The midwifery practices providing healthcare services to mothers in the experimental group are selected because they most closely correspond to the implementation of criteria 3 to 10 of the Ten Steps of the Baby-Friendly Hospital Initiative (BFHI) related to key clinical practices. Comprehensive services in the other three hospitals approximate these criteria to a lesser extent, as the intervention there is delivered by an individual specialist, whereas the midwifery practices operate through multidisciplinary teams (obstetricians, neonatologists, and midwives) working within an established programme. Nevertheless, breastfeeding guidance and support provided during several contacts throughout the hospital stay along with the opportunity for follow-up support during the first month (primarily delivered remotely via telephone calls and messaging with a trained specialist) – also demonstrate a sufficiently significant effect among mothers from state and municipal hospitals.

In the control group, mothers receive standard care as provided by the respective maternity hospitals, including routine breastfeeding-related support.

Between the second and sixth months postpartum, no controlled intervention is applied in either group. This design allows for assessment of both the long-term effect of the initial breastfeeding support provided around birth and during the first month, as well as the impact of subsequent support sought independently by the mother.

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[1] **IBCLC (International Board Certified Lactation Consultant)** is the global gold standard in clinical breastfeeding support. An IBCLC is a healthcare professional specialised in the clinical management of breastfeeding and lactation. IBCLCs are certified by the International Board of Lactation Consultant Examiners® under the auspices of the U.S. National Commission for Certifying Agencies. Currently, approximately 38,000 IBCLCs from 136 countries work in a variety of healthcare settings, including hospitals, paediatric practices, public health clinics, and private practices, where care is provided either in the home or in community-based consulting settings.

COMPARATIVE ANALYSIS OF THE EUROPEAN BLUEPRINT FOR ACTION AND NATIONAL POLICIES IN BULGARIA FOR THE PROTECTION, PROMOTION AND SUPPORT OF BREASTFEEDING

Based on information collected from documents and other sources regarding planned and implemented policies and programmes aimed at promoting breastfeeding, a comparative analysis is conducted between the European policy document *"Protection, Promotion and Support of Breastfeeding in Europe: A Blueprint for Action"* and the existing policies in Bulgaria.

The comparison is carried out across the five priority areas outlined in the 2008 revision of the European Blueprint for Action.

Priority area 1: Policy and planning

The European Blueprint for Action places emphasis on the development and implementation of a comprehensive, stand-alone national policy for the protection, promotion and support of breastfeeding, based on the Global Strategy for Infant and Young Child Feeding and integrated into the public health system. The analysis shows that such **a comprehensive policy is lacking in Bulgaria**, as is a **long-term strategic plan** or a set of coherent short-term operational plans. Although certain activities related to breastfeeding are included in other national programmes – the National Programme for Improving Maternal and Child Health 2021-2030 (NPIMCH), the National Programme for the Prevention of Chronic and Non-communicable Diseases 2021-2025 (NPPCND), and the Strategy for Child and Adolescent Health and Paediatric Care 2030 – these measures remain fragmented, limited in scope, and often confined to health promotion activities.

Policy. Following the completion of the National Food and Nutrition Plan (2005–2010) and the subsequent incorporation of its measures and activities into broader program documents (NPIMCH, NPPCND), there is currently no national policy in Bulgaria that explicitly prioritizes breastfeeding, nor are there specific measures targeting vulnerable groups. In addition, there is also a lack of professional clinical guidelines issued by medical associations (paediatrics, neonatology, obstetrics and gynaecology) aligned with international standards, which hampers the standardization of good practices.

Planning. Due to the absence of a comprehensive national breastfeeding policy, priorities, objectives and indicators have not been formulated. Strategic and operational plans with regular revisions based on monitoring are lacking. Breastfeeding is only partially integrated into public health planning documents, without addressing key areas such as systemic support, workforce training, monitoring mechanisms and regulatory measures.

Monitoring. Bulgaria lacks a national system for monitoring breastfeeding indicators based on standardised definitions and methodologies. Consequently, regular national data are not collected or published, limiting the capacity for informed planning and impact evaluation.

Management. Following the termination of the activities of the National Breastfeeding Committee (NBC) at the Ministry of Health (MoH), there is no designated national coordinator or coordinating body/intersectoral committee responsible for coordination, planning, and evaluation. Mechanisms ensuring continuity, accountability and systematic review of policy implementation have not been established.

Funding. Financial resources allocated within national programmes are insufficient and not targeted. Audit data from the NPIMCH show that some planned activities, including those related to breastfeeding, are implemented without earmarked funding or with minimal financial support. Only in 2023 limited funds are targeted covering a low range of activities. Breastfeeding-related services in both outpatient and inpatient care remain unfunded. Furthermore, mechanisms to safeguard the independence of policies and activities from manufacturers covered by the WHO International Code of Marketing of Breastmilk Substitutes, ratified by Bulgaria, are lacking.

Overall, Bulgaria demonstrates substantial shortcomings in relation to the recommendations under Priority Area 1. The key deficits include the absence of a comprehensive national policy, strategic and operational planning frameworks, coordination structures and mechanisms, sustainable financing, monitoring systems and active engagement of professional associations. The fragmented allocation of activities across multiple programmes does not ensure a coherent, systematic and sustainable approach. As a result, breastfeeding has not been institutionalised as a public health priority.

Priority area 2: Communication for behavioural and social change

Priority area 2 focuses on systematic, targeted, and evidence-based communication that informs women, families, and communities and supports the social and behavioural change necessary to increase breastfeeding rates and duration. The analysis shows that there are **significant structural deficits** in this area in Bulgaria.

Information, education, and communication for future and current parents. A national system for high-quality, personalised, and accessible counselling is not established. The number of trained health professionals and community-based volunteer counsellors capable of providing up-to-date, evidence-based support remains insufficient. There is no state mechanism to ensure the quality and compliance of information materials, with the exception of resources developed by the National Center for Public Health and Analyses, UNICEF, and the non-governmental sector. At the same time, materials affected by conflicts of interest are widely disseminated, including through healthcare facilities, in contradiction to the WHO International Code of Marketing of Breastmilk Substitutes.

The specific informational needs of high-risk groups – such as lower educational attainment or disadvantaged socio-economic status, first-time mothers, very young mothers, migrant women, and mothers with previous negative breastfeeding experiences – are neither systematically identified nor adequately addressed. The informational needs of family members also fall largely outside the scope of national efforts; relevant activities are carried out almost entirely by the non-governmental sector.

Communication at community and institutional level. In Bulgaria, continuity is observed primarily in the annual celebration of World Breastfeeding Week in the first week of August, involving public institutions and civil society organisations and achieving broader public visibility. Outside the campaign period, active communication is undertaken mainly by NGOs and some regional health inspectorates and is limited in scope. There is a need for nationally or regionally developed information and education packages targeting institutions such as health and social services, schools, media and policy-making bodies. In their absence, breastfeeding is rarely presented consistently as the normative method of infant feeding in line with international recommendations.

Media, monitoring, and observation of public attitudes. There is no national system for tracking the knowledge, attitudes, and behaviours related to breastfeeding. The lack of such monitoring hinders the development of targeted communication strategies and the evaluation of the effectiveness of existing initiatives. Media coverage is generally positive, but remains sporadic and predominantly campaign-driven.

Role of informal support and the civil society. A substantial proportion of the informational materials and training initiatives aimed at specific population groups (e.g., the Roma communities) are developed by non-governmental organizations on a project basis. Peer support networks such as "Mothers Support Mothers" and community-based volunteer breastfeeding counsellors provide valuable services; however, they are insufficiently recognised by the state as a resource and are not integrated into a comprehensive support system, which limits their reach and sustainability.

Комуникационните дейности, насочени към промяна на поведението в подкрепа на кърменето в България, биха могли да бъдат по-целенасочени и координирани на държавно ниво, тъй като в настоящия момент все още инициативите на гражданския сектор имат водеща роля. Липсват национални стандарти, материали, системи за мониторинг, механизми за избягване на конфликти на интереси и политики за адресиране на разнообразните потребности на различни групи. В резултат държавната комуникация не успява да изпълни ключовата си роля за създаване на подкрепяща социална и информационна среда, която все още се опира предимно на инициативи извън институционалната система.

Overall, communication activities aimed at supporting behavioural change in favour of breastfeeding in Bulgaria would benefit from greater strategic focus and coordination at the national level. At present, civil society initiatives continue to play a leading role. The absence of national standards, harmonised materials, monitoring systems, mechanisms for managing conflicts of interest, and policies to address the diverse needs of different population groups. prevents state communication from fulfilling its central role in creating a supportive social and informational environment. Breastfeeding promotion remains largely dependent on initiatives outside the institutional system.

Priority area 3: Training

Priority area 3 emphasizes the need for systematic, standardised, and evidence-based training for all categories of health professionals involved in the care of mothers and infants. The analysis shows that Bulgaria **lacks a comprehensive, structured, and sustainable system for breastfeeding training**, both at the academic level and within workplace-based continuing professional development.

Academic training. Undergraduate education for physicians, midwives, nurses, and other health professionals does not include standardised minimum module on breastfeeding that complies with WHO/UNICEF international recommendations. The topic is addressed only partially within other disciplines and does not provide the necessary training for working with mothers and newborns. In several universities, postgraduate courses or elective subjects have been introduced; however, these are not mandatory, reach only a limited proportion of students, and cannot ensure a uniform national standard of competence.

A postgraduate qualification programme in "Breastfeeding and Healthy and Dietary Nutrition Consultant", exists and is included in both the national classification of occupations and the nomenclature of specialties within the healthcare system, but solely as a non-clinical qualification. Due to the lack of structured opportunities for professional integration within the health system and the corresponding low demand, the programs remain limited in number, accessibility, and enrolment. The extent to which the curricula comply with international competency standards has not been formally evaluated.

Continuing education in the workplace. Bulgaria does not have a national standard that requires and regulates regular in-service training on breastfeeding for healthcare staff. In hospitals with maternity wards, continuing education in this field is rare, usually initiated by individual teams or managers, and most often delivered as one-off short-term courses. This results in substantial variability between hospitals and insufficiently up-to-date knowledge among frontline staff. National training materials for continuing education that are independent of commercial interests have not been developed. Neither the coverage nor the effectiveness of workplace-based training is monitored, due to the absence of a monitoring system.

Training aligned with international standards and certification. Government policy does not actively encourage health professionals to participate in internationally recognised training programmes and certification such as IBCLC. International certification is insufficiently recognised within professional communities, and the lack of institutional incentives results in a very limited number of IBCLC-qualified specialists (approximately 13 in Bulgaria) all of whom obtain through personal initiative and at their own expense.

Роля на неправителствените организации. В България неправителственият сектор компенсира липсата на държавни образователни политики. Националната асоциация „Подкрепа за кърмене" (НАПК) организира 45-часови курсове, основани на програмата на СЗО/УНИЦЕФ, водени от лектори с международна сертификация(IBCLC). Тези курсове предоставят качествено обучение, но достигат до ограничен брой специалисти и не могат да заместят държавната образователна инфраструктура.

Приоритетна област 3 е изключително важна, но недостатъчно развита в България. За устойчивото й развитие е необходимо: стандартизирано академично обучение, високо покритие на продължаващото обучение, на регулации и мониторинг, институционална подкрепа за специализирани квалификации, подкрепяща, а не основна роля на гражданския сектор в образователните инициативи. Тези пропуски значително ограничават капацитета на здравната система да предоставя качествена подкрепа за кърменето и допринасят за вариабилността в клиничните практики в страната.

Role of non-governmental organizations. In Bulgaria, the non-governmental sector partially compensates for the absence of state-led educational policies. The National Association for Breastfeeding Support (NABS) organises 45-hour training courses based on the WHO/UNICEF programme, led by internationally certified lecturers (IBCLCs). While these courses provide quality training, they reach a limited number of professionals and cannot substitute for a state-supported educational infrastructure.

Priority area 3 is of critical importance but insufficiently developed in Bulgaria. Its sustainable advancement requires: standardised academic education, broad coverage of continuing professional training, regulatory frameworks and monitoring mechanisms,

institutional support for specialised qualifications, and a complementary—rather than substitutive – role for the civil society in educational initiatives. These gaps substantially constrain the capacity of the health system to deliver high-quality breastfeeding support and contribute to persistent variability in clinical practices across the country.

Priority area 4: Protection, promotion, and support

Priority area 4 brings together key mechanisms required to ensure an environment that protects mothers' right to breastfeed, supports their practical needs, and promotes continued breastfeeding. It encompasses the Global Strategy for Infant and Young Child Feeding, the International Code of Marketing of Breastmilk Substitutes, the Baby-Friendly Hospital Initiative (BFHI), legislation protecting working mothers, and other models for community-based support. The analysis shows that Bulgaria **partially addresses individual components**, while most sub-areas lack a comprehensive policy framework and sustainable system of implementation.

Implementation of the Global Strategy for Infant and Young Child Feeding and monitoring of its implementation. Bulgaria does not have national policies grounded in the WHO Global Strategy on Infant and Young Child Feeding. There are no policy documents that systematically integrate recommendations on early initiation of breastfeeding, exclusive breastfeeding, and continued breastfeeding up to 2 years of age and beyond. Due to the absence of a national action plan, there is also no monitoring system in place, making it impossible to track progress on key indicators or to assess impact.

Compliance with the International Code of Marketing of Breastmilk Substitutes. Bulgaria partially complies with the International Code, primarily through EU legislation regulating the labelling of infant formula. However, several critical are missing:

➢ national legislation prohibiting promotions, gifts, marketing practices, or sponsorship by manufacturers and distributors of products covered by the Code;
➢ a mechanism for monitoring and enforcement violations;
➢ regulatory sanctions;
➢ adequate awareness among health professionals of their responsibilities under the Code
➢ regulations to prevent conflicts of interest in training, health promotion materials, and professional events.

As a result, materials developed or financed by infant formula manufacturers are widely disseminated in Bulgaria, including through hospital settings.

Legislation protecting working mothers. This area is the most developed at the national level. Labor legislation in Bulgaria provides some of the most favourable maternity leave provisions in Europe, which support breastfeeding during the early months. The Labor Code also regulates breastfeeding breaks for employed breastfeeding women. Nevertheless, several areas require further development:

➢ provision of regulated supportive environments for expressing and storing breast milk in the workplace;
➢ incentives for employers of breastfeeding women;
➢ improved information for employers, health professionals, and the general public regarding the rights of working mothers;

> extension of legal protection to all categories of breastfeeding women, including students, migrants and others.

Baby-Friendly Hospital Initiative. The BFHI is among the weakest implemented components. Despite its early introduction, the program is currently not functioning in practice:

> no hospital currently meets the BFHI standards or maintains accreditation;
> there is no state policy, funding, or technical support for the implementation of the Ten Steps;
> BFHI criteria are not integrated into hospital accreditation systems;
> the support steps, including Step 10, are not structurally linked to the community-based services;
> Involvement of fathers and families remains limited.

Sone hospitals voluntarily apply selected elements of good practice, but reflects the efforts of individual teams rather than a systematic policy approach.

Highly specialised support from healthcare professionals. The capacity to provide qualified support is limited:

> the number of trained health professionals is low;
> there are only 13 IBCLC consultants in the country;
> there is no clinical recognition or regulatory framework for lactation specialists and, consequently, no mechanisms for financing such services through the National Health Insurance Fund (including the absence of free services in both hospital and outpatient care);
> quality assurance mechanisms and systems for patient feedback are lacking;
> support for mothers of sick or preterm infants is insufficient, including inadequate facilities for milk expression, refusal to accept expressed breast milk in many neonatal units, and limited availability of donor milk.

Volunteer counsellors and peer support groups. Civil society organisations maintain networks of volunteer counsellors operating under the "mother-to-mother support" model. However, these networks are insufficiently recognised by the state as a community support resource and are not integrated into the formal support system. There are no nationally developed or funded community-level training programmes, nor mechanisms for collaboration between health professionals and community networks. Historically, partial institutional support was provided through the establishment of the National Association for Breastfeeding Support in 2010 under the auspices of the then functioning National Breastfeeding Committee at the Ministry of Health.

Подкрепа в общността и семейството. Подкрепата за кърмене в общността е несистемна, тъй като липсват общностни програми за подкрепа на кърменето извън гражданския сектор, целеви дейности за уязвими групи и предоставяне на информация за достъпните услуги. Отделни организации (Тръст за социална алтернатива, Мрежа здравни медиатори, НАПК, Ла Лече Лига България" работят проектно без държавна подкрепа.

По приоритетна област 4 също има структурни дефицити в националната политика за кърмене. България разполага с благоприятни елементи (като продължителния отпуск по майчинство), но в почти всички останали компоненти – Международния кодекс, БПБ,

системата за подкрепа и услуги др.– липсва системна държавна политика, финансиране, регулации и координация. Това силно ограничава качеството и достъпността на подкрепата за кърмене и подчертава необходимостта от национален стратегически документ и устойчиви механизми за прилагането на мерките му.

Community and family support. Breastfeeding support in the community remains fragmented and unsystematic. There are no publicly supported community-based breastfeeding programmes outside the civil sector, no targeted interventions for vulnerable groups, and no structured provision of information on available services. Several organizations (Trust for Social Achievement, the Network of Health Mediators, National Association for Breastfeeding Support, La Leche League Bulgaria) work on a project basis without state support.

Priority area 4 also reveals substantial deficits in national breastfeeding policy. While Bulgaria has certain favourable elements, such as extended maternity leave, most other components – including implementation of the International Code, the BFHI, the support and services system – lack coherent state policy, funding, regulation, and coordination. This significantly limits the quality and accessibility of breastfeeding support and highlights the need for a national strategic framework and sustainable mechanisms for implementation.

Priority area 5: Research

Priority area 5 emphasises the need for systematic, regular, and high-quality research on breastfeeding and of infant and young child feeding to generate reliable data for policy planning, monitoring, and evaluation. Bulgaria **lacks a national research framework in the field of breastfeeding**, there are no sustainable mechanisms for routine data collection, and existing studies are fragmented, predominantly project-based, and insufficient for the systematic monitoring of trends.

Bulgaria does not have a national research plan or coordinated framework addressing breastfeeding and infant and young child nutrition. The most recent comprehensive nationally representative study on infant and young child feeding, providing a detailed picture of breastfeeding rates and practices, dates back to 2007 and was conducted by the National Center for Public Health and Analyses (NCPHA) with UNICEF funding. Apart from partial scientific data derived from periodic surveys with broader thematic scope, funded under the National Programme for the Prevention and Control of Noncommunicable Diseases, research on breastfeeding in Bulgaria remains limited. Most studies on breastfeeding in Bulgaria result from the initiatives of individual interested teams, specialists, academic institutions, or NGOs. There is a lack of coordination mechanisms between ministries, scientific organizations, and health structures, as well as a lack of clear priority topics.

Priority area 5 **is insufficiently addressed in Bulgaria**. The absence of comprehensive national data, routine monitoring systems, and strategic research planning prevents meaningful evaluation on progress and hinders policy development. Establishing a national research framework is therefore essential to ensure regular, representative, and methodologically standardised studies, as well as the integration of breastfeeding indicators into national health information and surveillance systems.

ANALYSIS OF THE EMPIRICAL STUDY RESULTS ON THE EFFECT OF GOOD PRACTICES FOR THE PROTECTION, PROMOTION AND SUPPORT OF BREASTFEEDING IN HOSPITAL SETTINGS

1. Socio-demographic and clinical characteristics

The analysis of socio-demographic characteristics shows that the study groups are largely comparable with respect to key indicators, providing a solid basis for comparing the effects of the intervention. The mean age of the participants is 32.02±5.17 years – 32.68 ± 4.74 years for the experimental group (EG) and 31.34± 5.52 years for the control group (CG), with no statistically significant difference between the two groups (unpaired samples t-test t=-1.975; p=0.05). The proportion of mothers aged over 35 years is similar in both groups – 28% in the EG and 23.7% in the CG. This balanced distribution, together with the absence of a statistically significant difference in the combined indicator with a potentially less favorable prognosis for breastfeeding success ("advanced maternal age + first child") (χ^2=0.37; p=0.83), indicates that age-related differences do not affect the main outcomes.

The distribution by place of residence is comparable between the groups, with a predominance of participants living in large urban areas. In the EG, 89.8% reside in large or medium-sized cities, compared to 87.7% in the CG. The high level of urbanization of the sample should be considered a characteristic of the study, but it does not introduce group asymmetry.

With regard of education, statistically significant difference is observed between the groups: the proportion of mothers with higher education is higher in the EG (90.7%) than in the CG (79.8%) (χ^2(1)=5.46; p=0.019). As education represents a factor that may potentially influence breastfeeding success, a follow-up sub-analysis is conducted.

No statistically significant differences are identified between the two groups in terms of birth order and other key clinical indicators, supporting the assumption that the groups are comparable with respect to the main prenatal and perinatal characteristics.

Table 1. Structural distribution of study participants by socio-demographic characteristics

	EG	CG	Total
Age (mean ± SD) (years)	32.68 ± 4.74	31.34 ± 5.52	32.02 ± 5.17
Education (n)			
University	107	91	198
High School *(general or vocational upper secondary education)* or lower	11	23	34
Birth order (n)			
First child	63	63	126
Two or more children	55	51	106
Place of residence (n)			
Large and medium-sized cities	106	100	206
Small towns/villages	12	14	26
Maternal conditions potentially affecting lactation (n)			
None	74	71	145
One or more	44	43	87

With regard to breastfeeding intentions, a high level of desire to breastfeed is observed in the initial stage in both groups – 100% in the EG (n=118) and 95.6% in the CG (n=109). (Fig. 2)
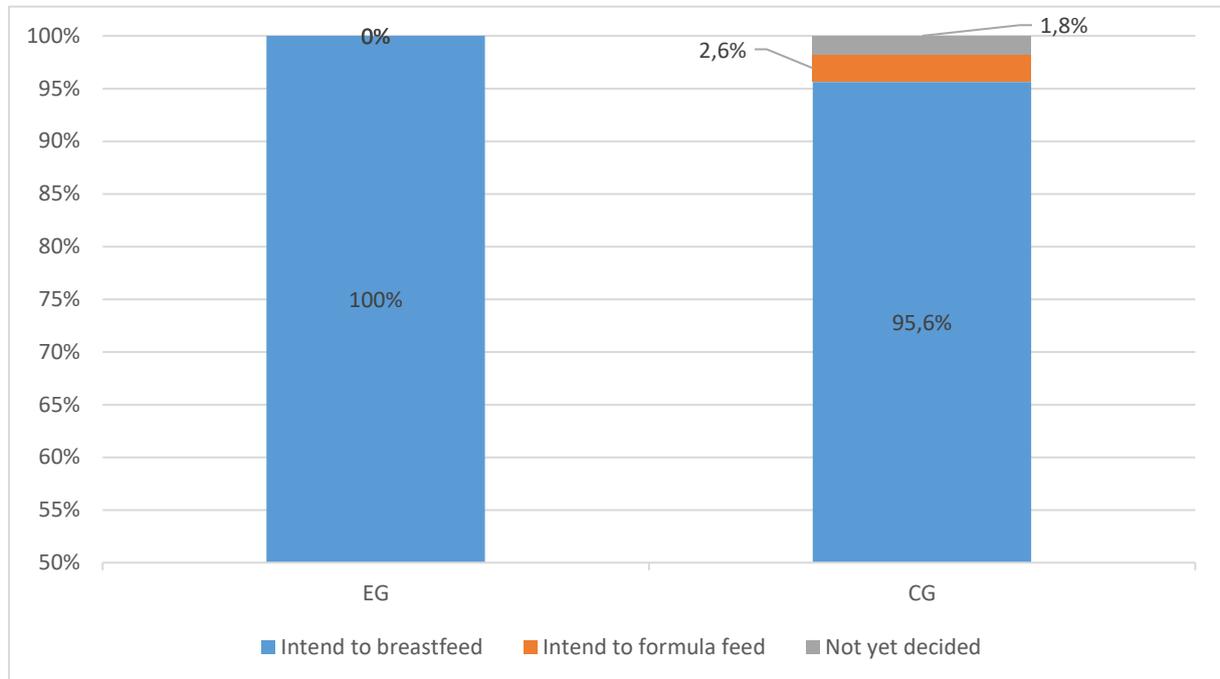

Figure 2. Breastfeeding intentions during the early postpartum period

2. Differences between groups affecting the results

At the structural level, factors are identified that may potentially influence breastfeeding success.

2.1. Differences according to level of education

The analysis shows a statistically significant association between educational level and type of feeding both at the end of the first month (χ^2=9.8; p=0.02) and at the end of the sixth month (χ^2=9.3; p=0.03). As the level of education increases, the likelihood of exclusive breastfeeding (EBF) also increases (linear association p=0.017 at 1 month; p=0.006 at 6 months). The correlation coefficients (r=0.16 - 0.18) indicate a weak association, suggesting that education is a supportive but not a determining factor.

To assess the impact of the observed group imbalance, sub-analyses are conducted among mothers with university education and those with high school and lower education.

The results are fully consistent with the overall trend: the proportion of exclusively breastfed infants in the first days is significantly higher in the EG (81.3%) compared to the CG (45.1%) (χ^2=26.67; p<0.001), and this advantage is maintained at both 1 month and 6 months. The differences between groups among mothers with higher education almost completely mirror those observed in the total sample (Fig. 3). This indicates that higher education increases the likelihood of breastfeeding, but does not independently explain the observed improvement in the EG.
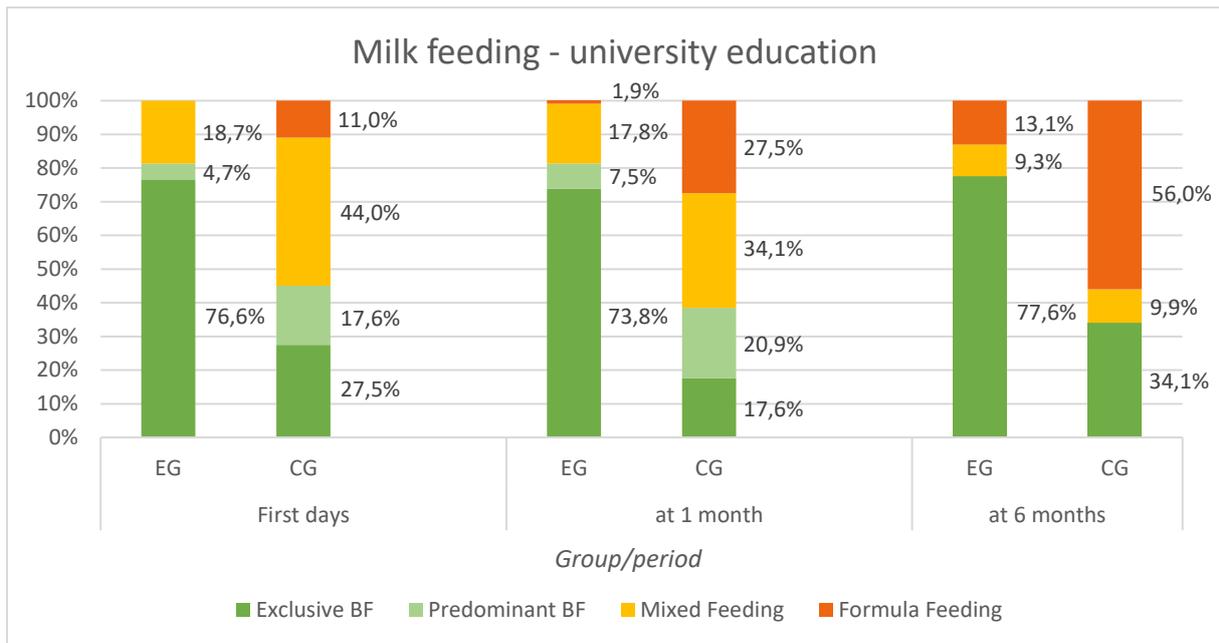
Figure 3. Breastfeeding practices by period of observation among mothers with university education

The differences among mothers with high school and lower education are even more pronounced: in the EG breastfeeding rates are higher at all stages, whereas in the CG the proportion of breastmilk substitute feeding is substantially higher, especially at six months (Fig. 4). In both educational subgroups, belonging to the EG or CG is statistically significantly associated with the type of feeding (p<0.001 at all stages).
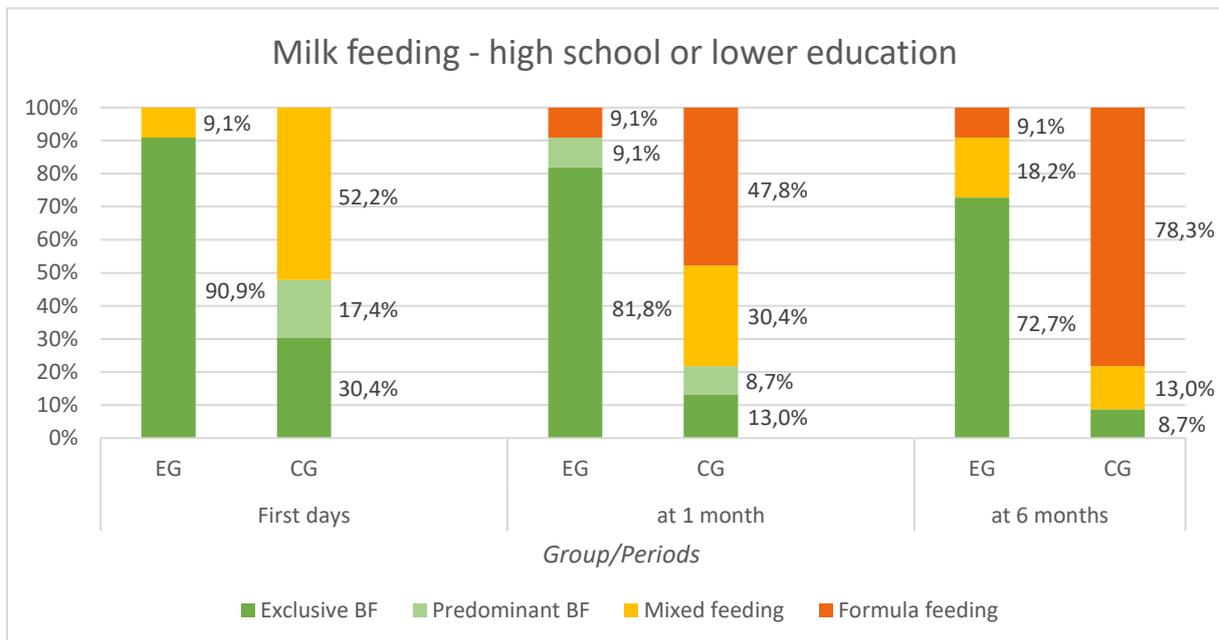
Figure 4. Breastfeeding practices by period of observation among mothers with high school or lower education

In summary, higher education functions as a supportive but limited factor in breastfeeding. The provision of specialised support has a substantially greater impact, improving breastfeeding rates in both educational groups, with the strongest effect observed among mothers with high school or lower education.

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2.2. Differences according to previous breastfeeding experience

Previous experience is a strong predictor of success. The data demonstrate a statistically significant association between prior experience and type of feeding in the overall analysis (χ^2 = 57.443; p < 0.001 at 1 month and χ^2 = 61.479, p < 0.001 at 6 month). The correlation coefficients (Pearson's r≈0.29; Spearman's ρ≈0.22) indicate a positive, albeit moderate, relationship, suggesting that greater prior experience is associated with a higher likelihood of exclusive breastfeeding.

The sub-analysis among mothers with ≥6 months of previous experience reveals a clear advantage for the EG: during the first days, 100% of mothers in the EG breastfeed, compared with 75% in the CG. At 6 months, breastfeeding is maintained by 93.9% of mothers in the EG and by 50% in the CG (Fig. 5). The CG exhibited more unfavourable trends, including a transition to mixed or substitute feeding.
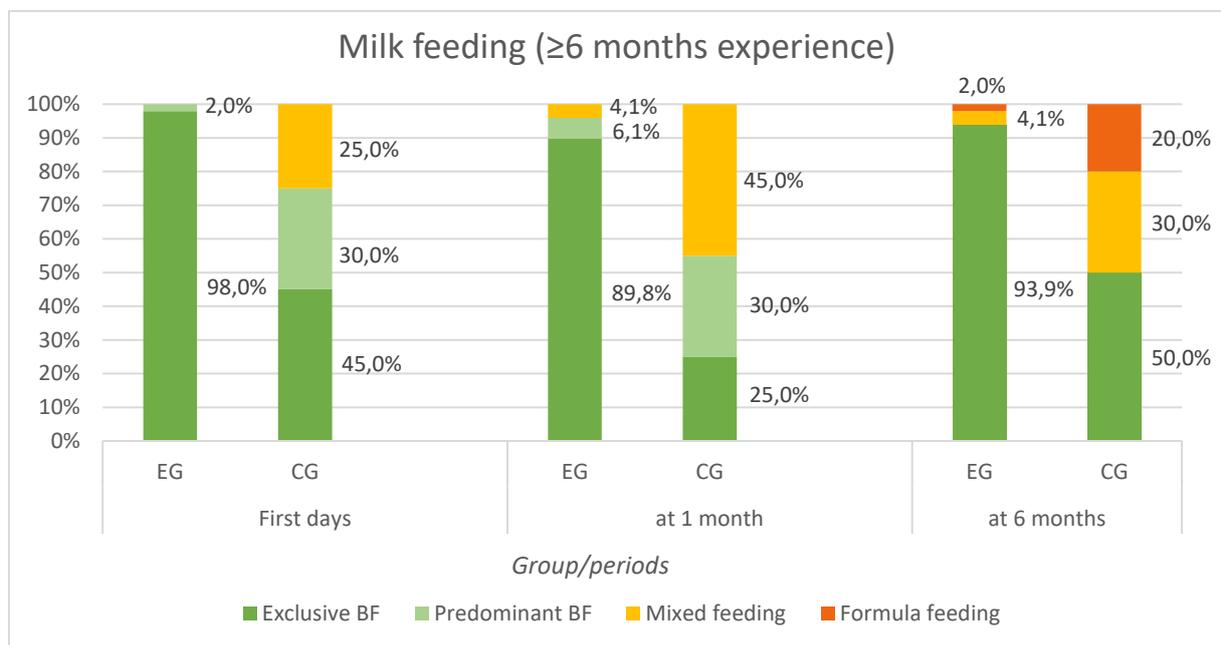

Figure 5. Breastfeeding practices by period of observation among mothers with prior breastfeeding experience ≥6 months

The results show that experience is important, but does not eliminate the need for support. The differences between the EG and the CG remain significant even within the subgroup with the highest probability of success, indicating a synergistic effect between prior experience and the intervention.

2.3. Differences in previous health conditions

Maternal health conditions with a potential impact on lactation influence breastfeeding outcomes only in the early period. A statistically significant association with breastfeeding success is observed at the end of the first month (χ^2=14.08; p=0.029), but not at sixth months. This is likely because, if mothers with health-related challenges succeed in establishing breastfeeding during the first month, they tend either to maintain it thereafter, or other factors become more influential in cases of unfavourable development. The distribution of mothers with health conditions is similar in the two groups (approximately 37%), which means that this factor does not bias the comparison between the experimental and control groups.

2.4. Differences according to mode of delivery

Analysis of the impact of mode of delivery shows that operative delivery is a significant factor associated with lower breastfeeding rates] however, the availability of specialised support substantially mitigates this effect. The proportion of mothers who give birth by caesarean section is significantly lower in the EG (24.6%) compared with 56.1% in the CG (χ^2=24.05; p<0.001). Given the known influence of operative delivery on early breastfeeding, and the marked difference in proportions between the two groups, sub-analyses are performed according to mode of delivery.

In the subgroup of mothers who undergo operative delivery, the EG demonstrates significantly better outcomes. At discharge, 75.9% of infants are exclusively or predominantly breastfed, compared with 39.1% in the CG (χ^2=10.81; p=0.001). By the end of the first month, the differences become more pronounced: only two mothers in the EG switch to infant formula, whereas in the CG the proportion of mixed or substitute feeding increases more than two and a half times. At six months, breastfeeding rates decline in both groups; however, breastfeeding is maintained in a significantly higher proportion of mothers in the EG, while the CG again shows a greater increase in substitute feeding, with the differences remaining statistically significant (p=0.001) (Fig. 6).
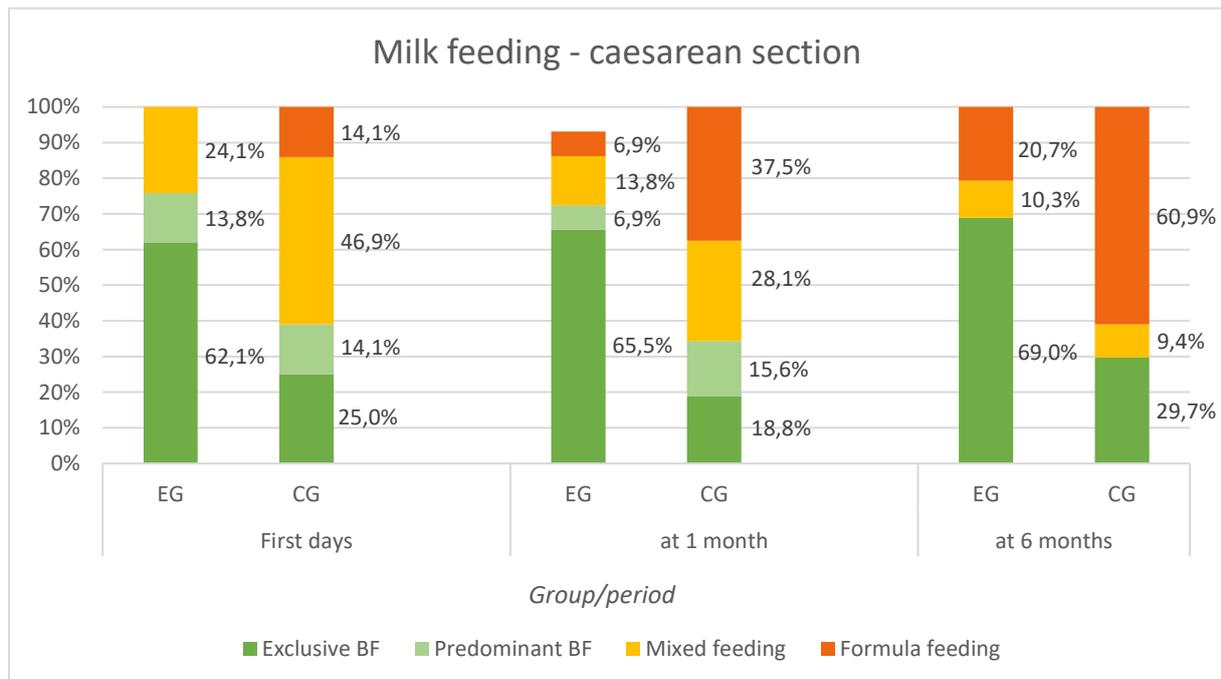

Figure 6. Breastfeeding practices by period of observation among mothers with caesarean section

Similar results also are observed in mothers who gave birth vaginally. At all stages—after discharge, at one month, and at six months—the association between assignment to the EG or CG and the type of feeding is statistically significant (χ^2=13.69 to χ^2=54.82; p<0.001). In the EG, a significantly higher proportion of mothers initiate breastfeeding in the maternity ward, and at one month the proportion of exclusive breastfeeding is much higher (68 out of 89), in contrast to the CG, where only 7 of 50 mothers continue exclusive breastfeeding. At 6 months, breastfeeding is maintained by a significantly larger proportion of mothers in the EG, whereas infant formula feeding predominates in the CG.

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Regardless of mode of delivery, the intervention demonstrates a clear and sustained effect on the continuation of breastfeeding; in cases of operative delivery, it effectively compensates for the unfavourable initial conditions.

2.5. Differences by hospital type

The assessment of the influence of the type of medical facility shows a statistically significant association between delivery in a private hospital and a higher probability of exclusive breastfeeding (p<0.001).

The differences between the groups with regard to hospital type are statistically significant (χ^2=33.34; p<0.001) and should be taken into account when interpreting the results. In the EG, 72% of mothers give birth in private hospitals, whereas in the CG 65.8% give birth in state or municipal hospitals. This factor is therefore considered and its influence is examined through additional sub-analyses stratified by hospital type.

The results clearly show a higher prevalence of breastfeeding in the EG at all stages of observation (χ^2 ranging from 36.85 to 43.58; all p<0.001). In the EG, almost all mothers initiate exclusive breastfeeding, while in the CG mixed feeding dominates, despite the comparatively more favourable hospital environment (Fig. 7).
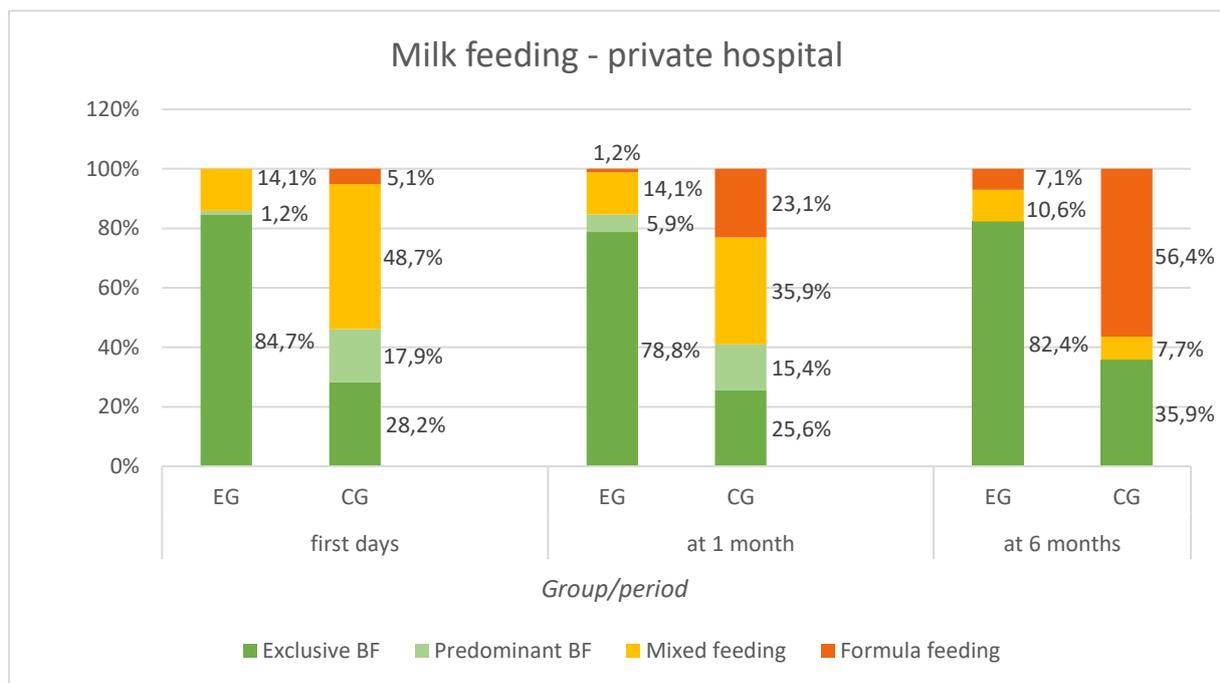

Figure 7. Breastfeeding practices by period of observation among mothers from private hospitals

The intervention also demonstrates a strong effect in cases of births in state or municipal hospitals. The differences between the groups are statistically significant already in the first days (χ^2=10.41; p=0.015), become more pronounced at 1 month (χ^2=30.12; p<0.001) and persist at 6 months (χ^2=14.39; p=0.002).

Hospital type of exerts partial influence; however, the intervention improves outcomes across all contexts, which confirms that the decisive factor is the provision of support, rather than institutional setting itself.

3. Factors related to clinical support for breastfeeding

Clinical practices during the postnatal hospital stay are an essential part of breastfeeding support and have a substantial impact on the initiation and maintenance of breastfeeding. Selected evidence-based clinical practices for breastfeeding support, included in The 10 Steps to Successful Breastfeeding underpinning the BFHI program, are subjected to descriptive analysis and testing for statistical significance in this sample, tracking both group differences between the EG and CG and the associations between these practices and exclusive breastfeeding at different stages.

3.1. Early contact

Early skin-to-skin contact, as defined in Step 4 of The 10 Steps to Successful Breastfeeding, shows pronounced differences between the two groups (Fig. 8).

 In the EG, 53.4% of mothers initiate breastfeeding within the first hour after birth, while only 6.1% do so in the control group. Almost three-quarters of mothers in the EG initiate breastfeeding within the first 6 hours, compared with 24.3% in the CG. The proportion of mothers in the CG who do not put the baby to the breast within the first 24 hours is also significantly higher. This finding is likely attributable to the higher prevalence of operative deliveries and the widespread practice of prolonged mother-infant separation after caesarean birth.
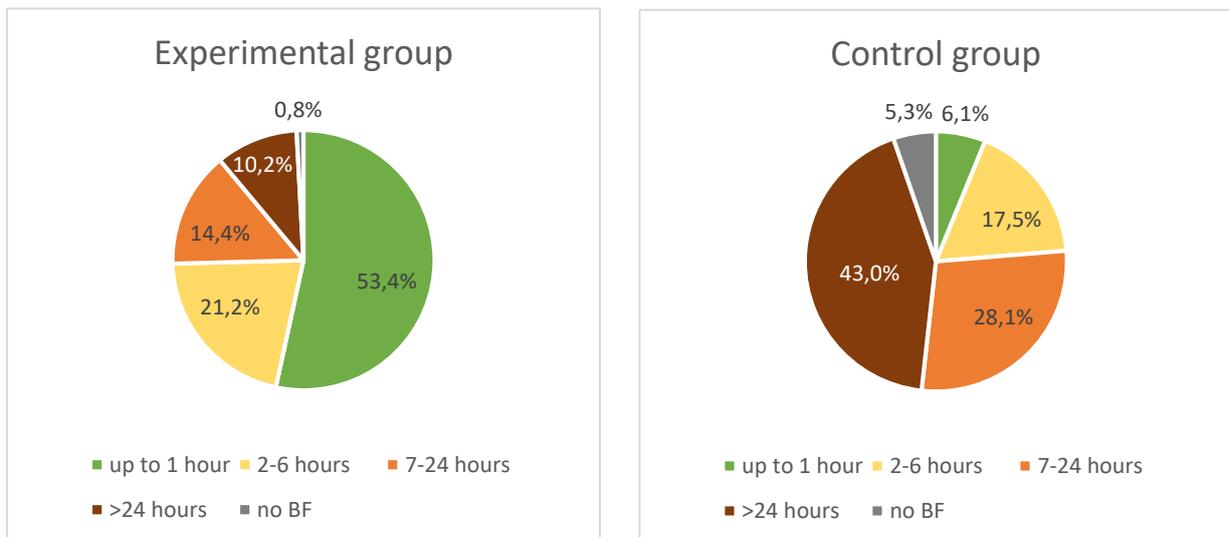

Figure 8. Distribution of time to breastfeeding initiation within the first 24 hours after birth and thereafter in the experimental and control groups

Statistical analysis confirms that the timing of first contact is a strong predictor of breastfeeding success (Fig. 9). A significant and moderately strong positive association is identified between early contact and exclusive breastfeeding in the first month (χ^2=63.95; p<0.001; r≈0.43), with mothers who initiate breastfeeding within the first hour showing the highest levels of continued breastfeeding. Delayed contact beyond 24 hours is mainly associated with a switch to mixed or formula feeding.

This association persists in the longer term. At six months, early initiation continues to be significantly associated with higher breastfeeding prevalence (χ^2=57.84; p<0.001; r≈0.40).

Mothers who initiate breastfeeding early maintain a higher proportion of breastmilk feeding, whereas delayed contact is associated with a predominance of infant formula feeding.

Figure 9. Relationship between the timing of first breastfeeding and feeding patterns at 1 month and 6 months.

The results clearly confirm the pivotal role of early contact as a clinical factor that supports both the successful initiation and sustainability of breastfeeding over the first six months. It emerges as one of the most significant predictors of success, especially in the context of operative deliveries, where the risk of delayed initiation is highest.

3.2. Support during the first breastfeeding

The analysis of the assistance provided by staff in helping mothers to position the baby at the breast in line with the recommendation in Step 5 of the 10 Steps to Successful Breastfeeding shows a markedly higher frequency and quality of support during the first breastfeeding in the experimental group. More than half of the mothers in the EG (57.6%) reported receiving significant assistance compared with only 25.4% the CG (p<0.001) (Fig. 10). Although subjective assessments may be affected by socially desirable responses and limited understanding of what constitutes clinically adequate support, the pattern is clear: mothers in the EG receive more comprehensive and purposeful support.

Statistical analysis indicates that support during the first breastfeeding is significantly associated with feeding patterns at one month (χ^2=33.89; p=0.004). The correlation is weak but significant (r≈0.16), suggesting that initial support exerts a real, albeit moderate, influence

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on early breastfeeding success. At six months, the association remains statistically significant (χ^2=28.57; p=0.018), although the correlations are no longer significant, indicating that the effect of this factor diminishes over time.

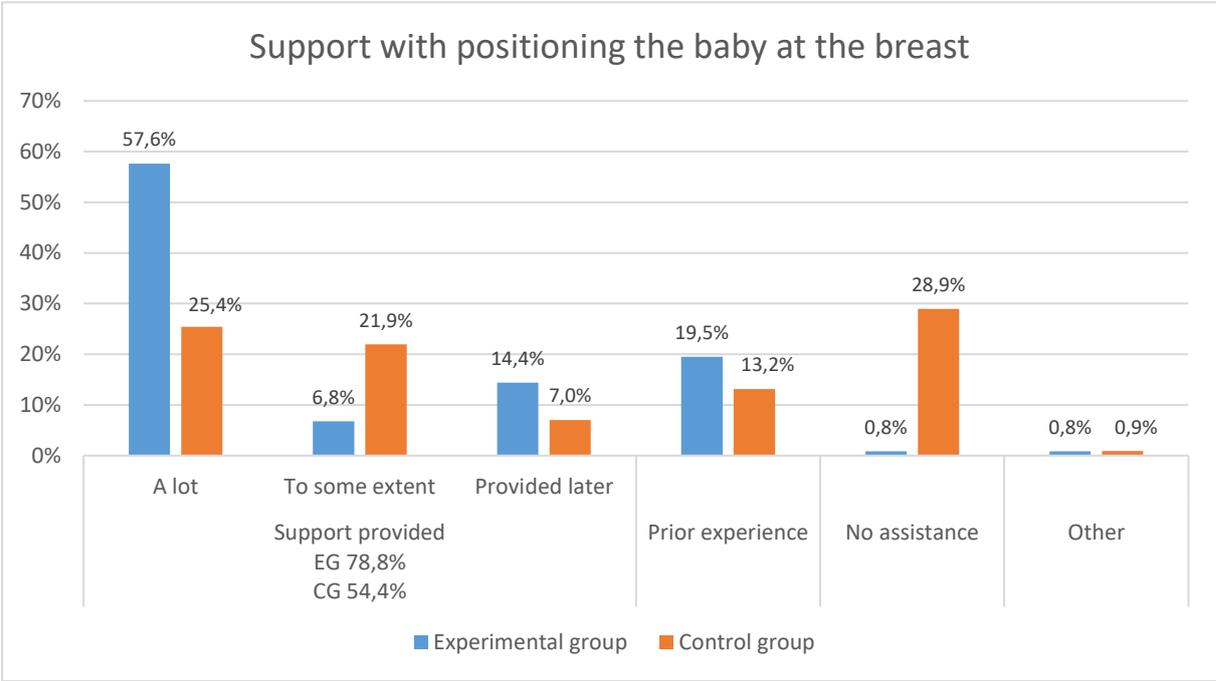Support with positioning the baby at the breast

Figure 10. Frequency of assistance received at the first breastfeeding attempt in the two study groups

The results obtained highlight the role of initial support in the first hours and days after birth as an important short-term predictor of exclusive breastfeeding. However, sustaining breastfeeding over a longer period requires additional and ongoing interventions (Fig. 11).
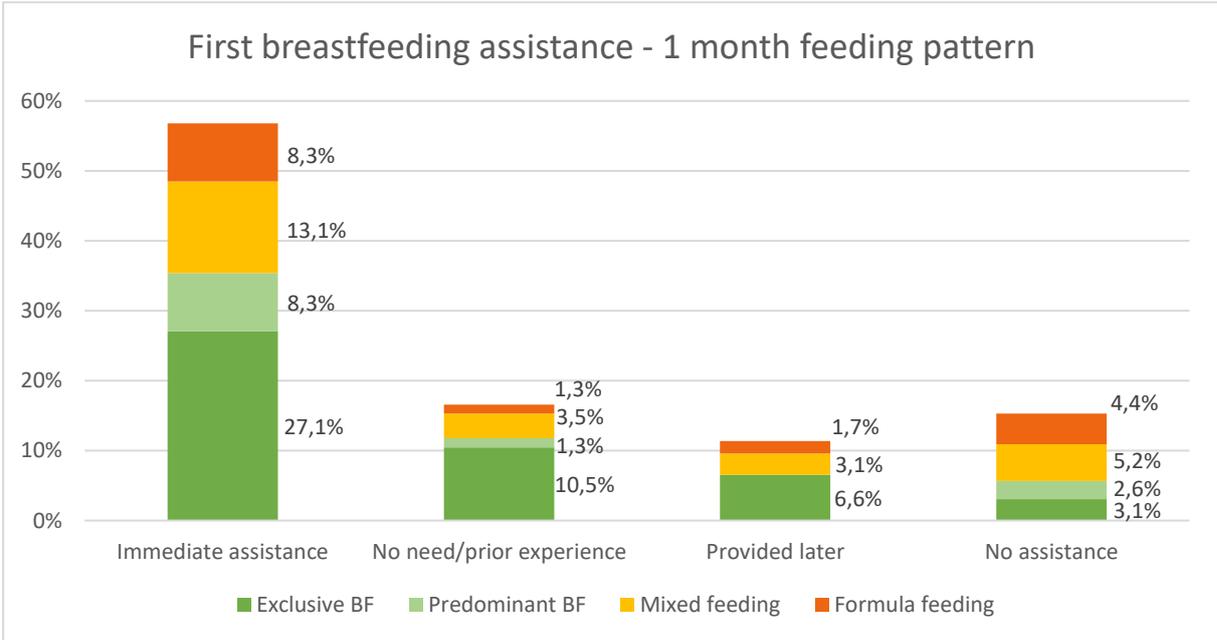
First breastfeeding assistance - 1 month feeding pattern

Figure 11. Association between support at the first breastfeeding and feeding patterns at 1 month.

3.3. Water offering

In relation to Step 6 ("do not give liquids or other foods without medical reason"), the data show that the routine practice of offering water in hospitals is no longer widespread.

Statistical analysis does not identify a significant association between the offering of water and feeding patterns either at the first month (p=0.111) or at the sixth month (p=0.76). This suggests that other hospital practices have a stronger influence on feeding patterns.

3.4. Formula milk offering by hospital staff

Offering formula milk without medical necessity (Step 6) is among the strongest negative factors associated with exclusive breastfeeding. The differences between the groups and the feeding patterns are clearly visible (Fig. 12).
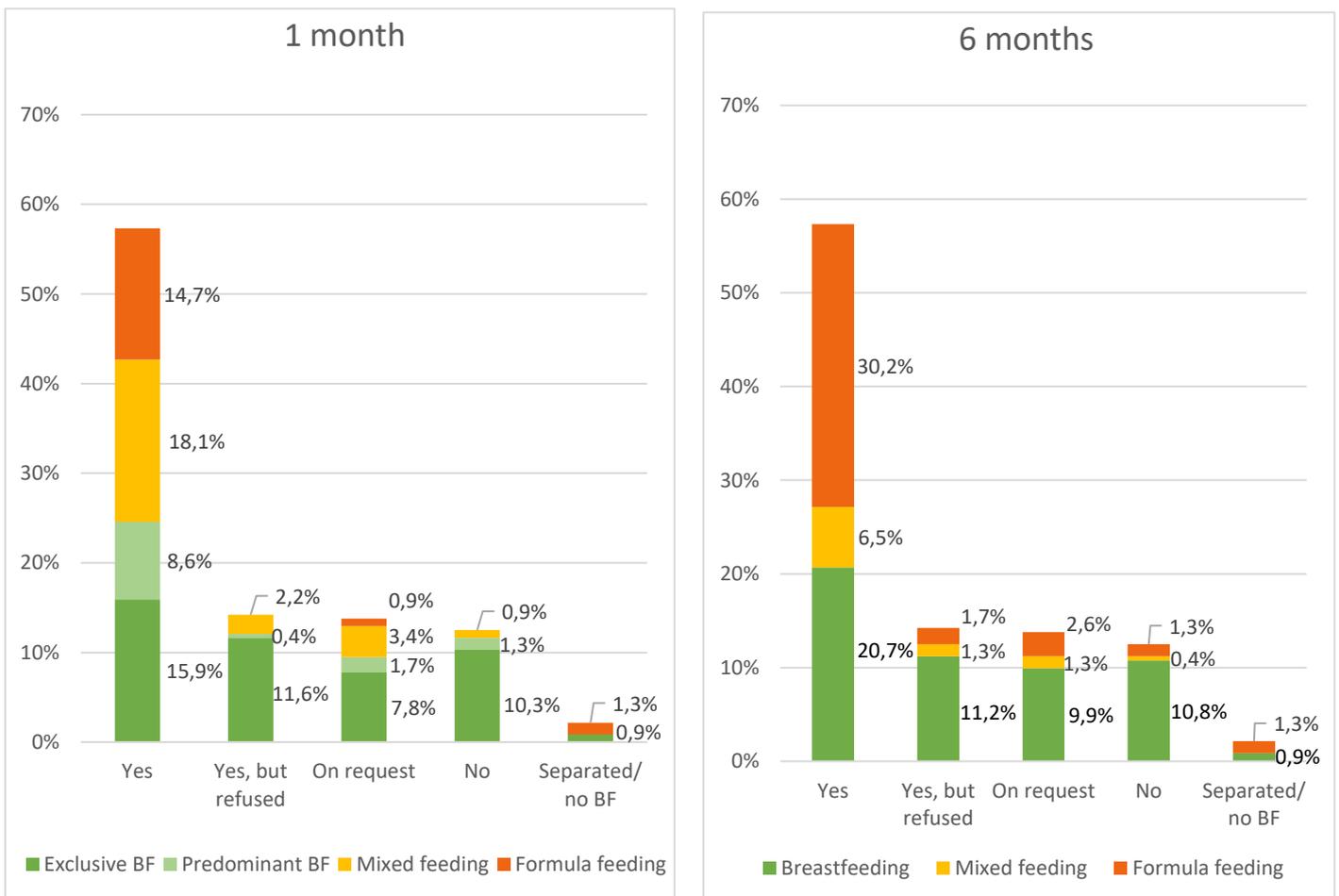

Figure 12. Association between offering formula milk by hospital staff and feeding patterns at 1 month and at 6 months.

Statistically significant associations with the type of milk feeding are identified both at the first ($\chi^2 = 64.5$; $p < 0.001$) and the sixth month ($\chi^2 = 46.035$; $p < 0.001$). The data show that when milk is offered without an explicit request from the mother, the likelihood of mixed or complete substitute feeding increases substantially. Conversely, mothers who are not offered

or refuse it are far more likely to maintain exclusive breastfeeding – 27 out of 33 at one month and 51 out of 62 at six months.

Correlation analysis confirms a moderate and statistically significant positive association between the absence of formula offering and higher levels of exclusive breastfeeding (r and ρ ≈ 0.47 at one month; r and ρ ≈ 0.38 at six months; $p < 0.001$). These findings highlight the crucial role of hospital practices: unnecessary formula offering acts as a strong negative factor for both initiation and continuation of exclusive breastfeeding.

3.5. Rooming-in of mother and baby

Rooming-in of mother and baby on a 24-hour basis (Step 7) is another component exhibiting clear group differences (Fig. 13). In the EG, significantly more mothers and infants are accommodated together, allowing for continuous contact and breastfeeding. The analysis reveals a statistically significant association between rooming-in and feeding patterns at both the first month ($\chi^2 = 50$; $p < 0.001$) and the sixth month ($\chi^2 = 41.3$; $p < 0.001$), with mothers in full rooming-in arrangements demonstrating a higher proportion of exclusive breastfeeding.
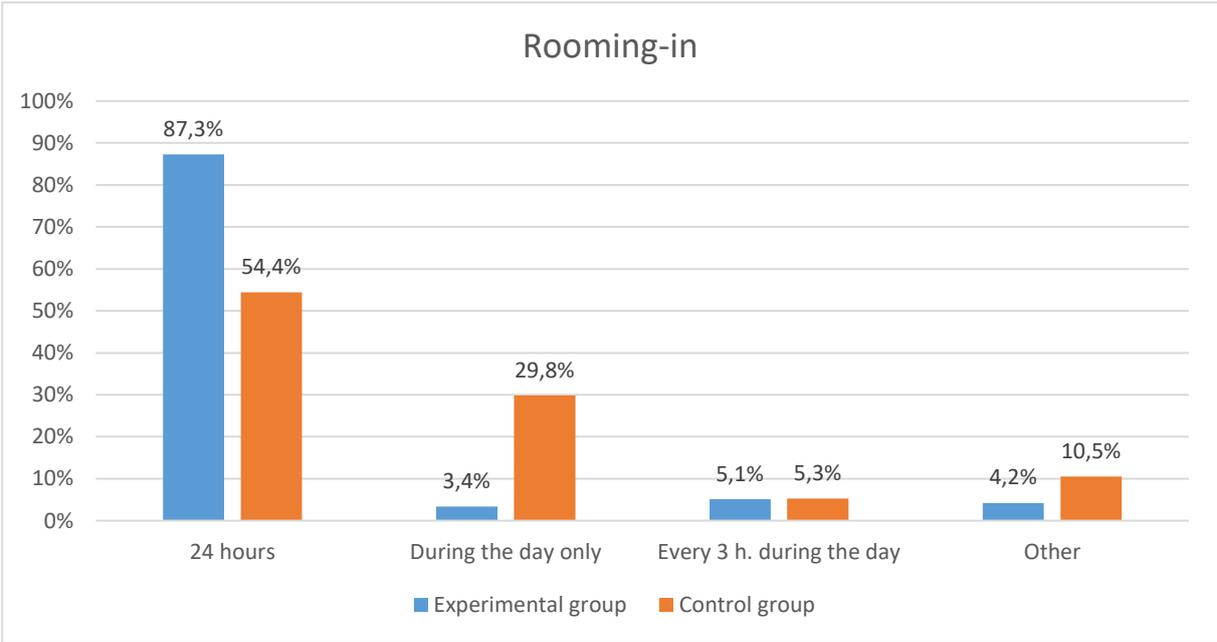

Figure 13. Distribution according to the type of mother-and-baby accommodation after birth in the two groups

Although the correlation coefficients (Spearman and Pearson) do not reach statistical significance, the observed trend supports the potential role of hospital care organization in facilitating successful and sustained breastfeeding (Fig. 14).
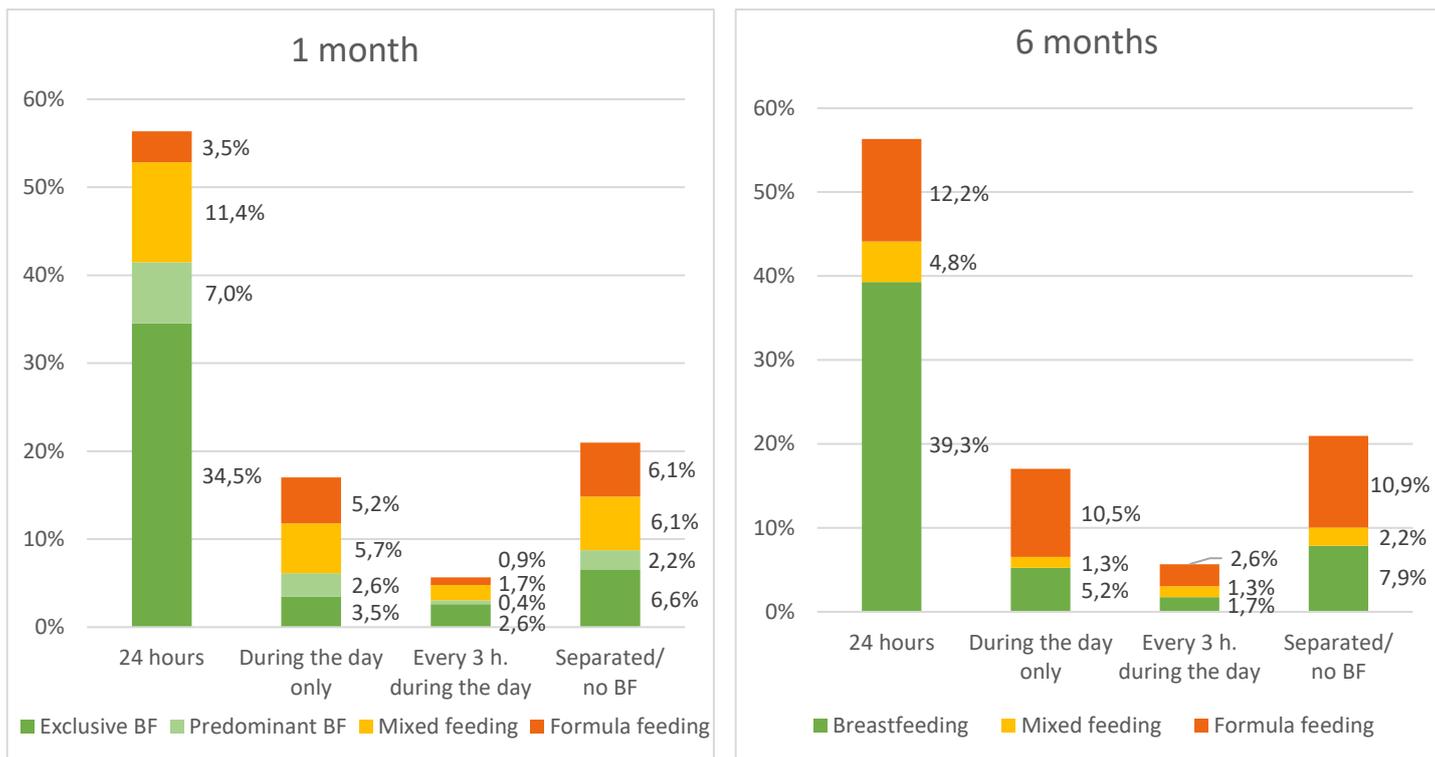
Figure 14. Association between rooming-in and feeding patterns at 1 month and at 6 months.

3.6. Post-discharge counselling

Ongoing support after discharge (Step 10) is a key element for breastfeeding continuation. Statistical analysis shows a significant association between the availability of counselling (in person or remote) and the type of milk feeding at both the first month (χ^2 = 34.38; $p < 0.001$) and the sixth month postpartum (χ^2 = 35.55; $p < 0.001$) (Fig. 15).

Figure 15. Association between post-discharge counselling in the first month and feeding patterns at 1 month and at 6 months.

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The data demonstrate that in the absence of counselling, infant formula feeding or mixed feeding is more common, whereas among mothers who received timely counselling, the proportion of exclusively breastfed infants is substantially higher in bo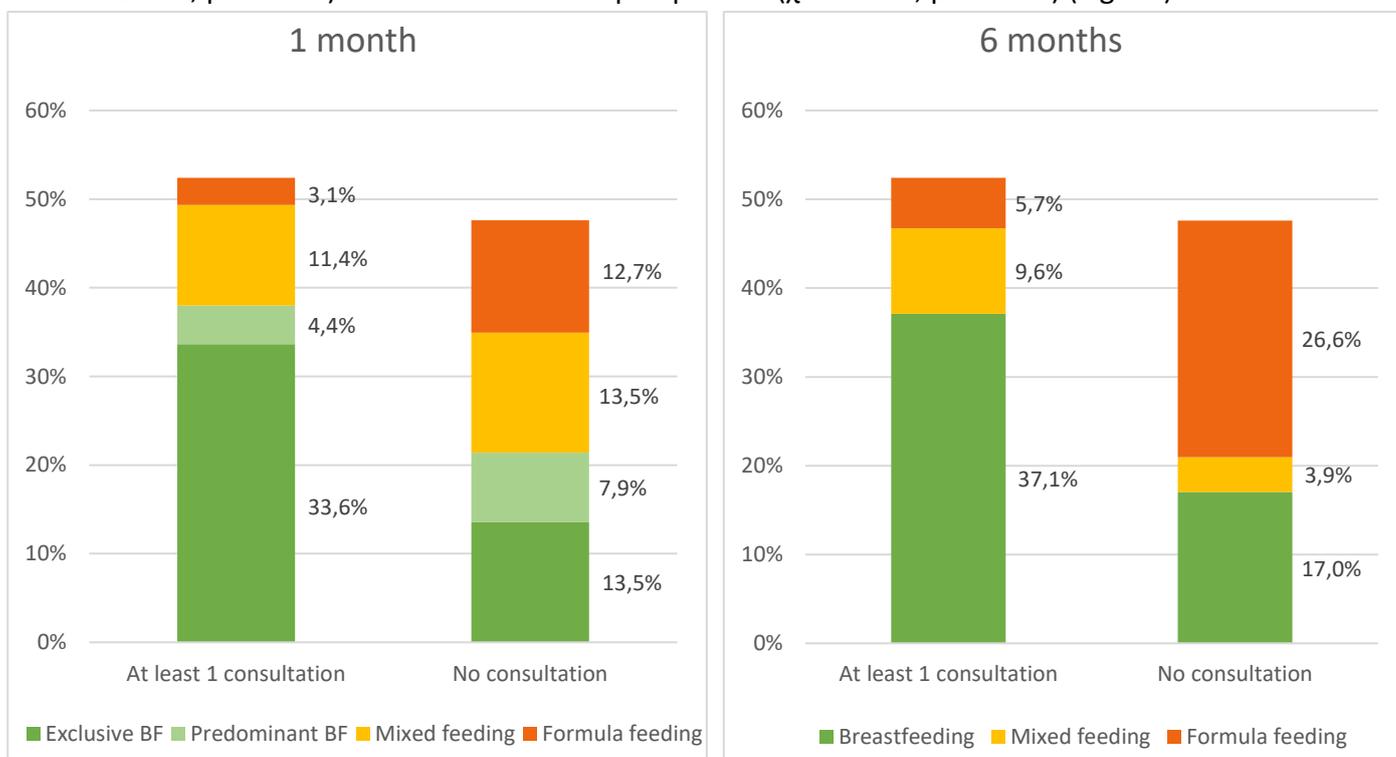th the short and long term. Correlation coefficients confirm a moderate positive relationship between counselling and successful breastfeeding at 1 and 6 months (r and $\rho \approx 0.38–0.39$; $p < 0.001$).

These findings underscore the need for continued post-discharge support, as its absence may hinder exclusive breastfeeding shorten its duration and is associated with an increased risk of mixed feeding or early transition to infant formula.

4. Type of milk feeding by group in the first days, at the end of the first month, and at the end of the sixth month

The analysis of the type of milk feeding – exclusive breastfeeding, predominant breastfeeding, mixed feeding, and infant formula feeding – across the three stages of observation shows clear and substantial differences between the experimental and control groups. These differences reflect the effect of breastfeeding support on infant feeding patterns.

4.1. First days after discharge:

Even in the first stage, the differences in feeding patterns between the two groups are significant (Fig. 16). The proportion of exclusively breastfeeding mothers in the EG is exceeds 78%, **more than 2.5 times higher** than in the CG (28.1%). Predominant feeding (breast milk + water/tea), although not recommended by international standards, is significantly more common in the CG (17.5% compared to 4.2% in the EG), suggesting a lower level of awareness or support for avoiding the early introduction of liquids.
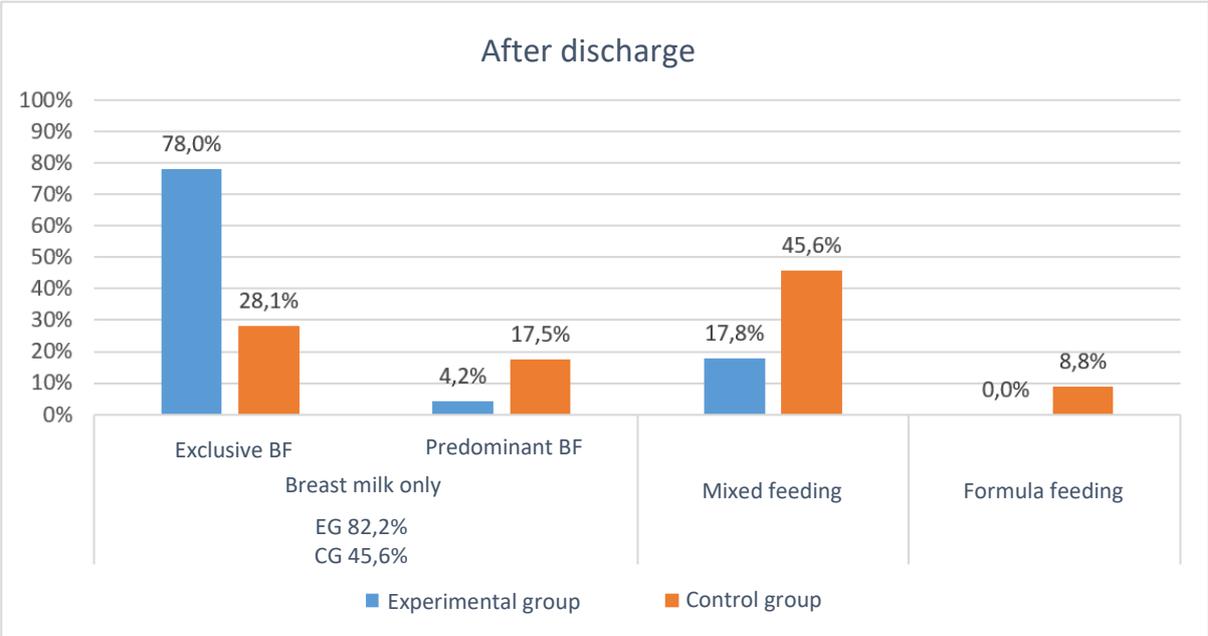

Figure 16. Distribution in the two groups according to the infant feeding pattern after discharge

Mixed feeding is substantially more frequent in the CG than in the EG (45.6%) compared with the EG (17.8%), while formula feeding is observed in 8.8% of mothers in the CG and is entirely absent in the EG (0%). These findings clearly demonstrate the effect of hospital-based breastfeeding support and information practices on mothers' early feeding choices.

A non-parametric Mann–Whitney test confirms the significant difference between the EG and CG (U = 10070, p<0.001). The effect size (d = 0.475) lies at the upper end of the moderate range according to Cohen's classification, indicating the exposure to the intervention has a substantial effect even in the first days (Fig. 17).

Total N	232
Mann-Whitney U	10 070,000
Wilcoxon W	17 091,000
Test Statistic	10 070,000
Standard Error	462,006
Standardized Test Statistic	7,238
Asymptotic Sig. (2-sided test)	,000
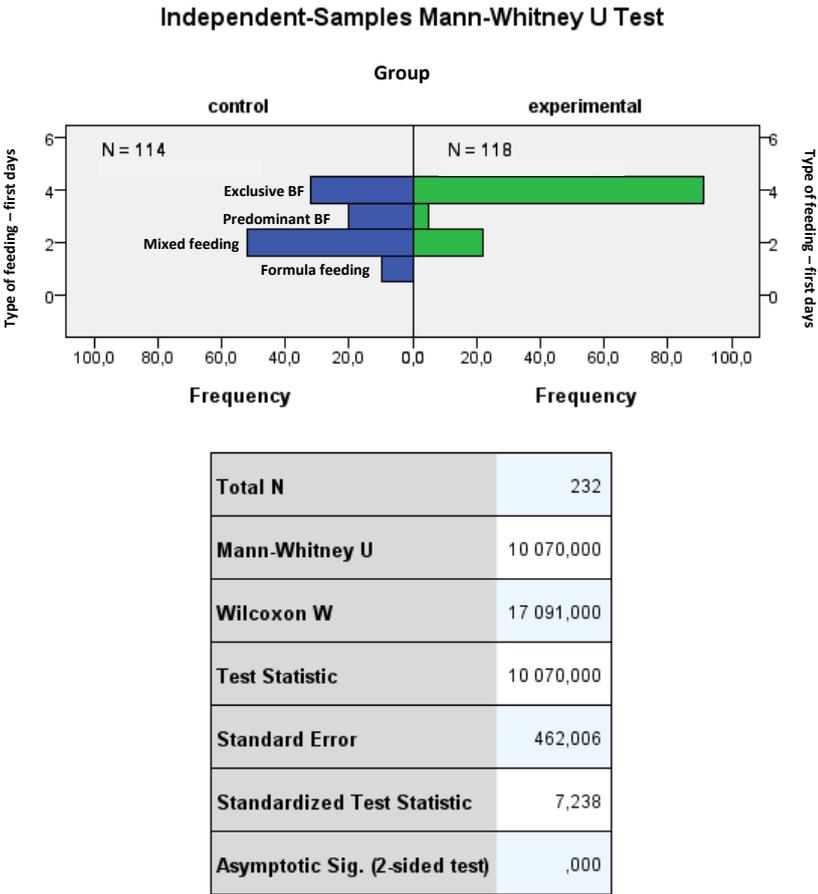
Figure 17. Distribution in the two groups according to the infant feeding pattern after discharge (Mann-Whitney test)

4.2. End of the first month:

At the end of the first month, the proportion of exclusive breastfeeding in the EG remains high (73.7%), whereas a marked decline is observed in the CG (16.7%) (Fig. 18). Even when exclusive and predominant breastfeeding are combined into a single "breast milk only" indicator, the differences remain pronounced – nearly unchanged in the EG and decreasing by over 10% in the CG.

Mixed feeding shows slight decline in the EG (−1.7%), while in the CG the reduction is more substantial (−12%) and corresponds to a sharp rise in formula feeding, which reaches 31.6% (**more than triple** the level observed in the first days). In the EG, only 2.5% of mothers transition to infant formula by the end of the first month.

At the end of the 1st month
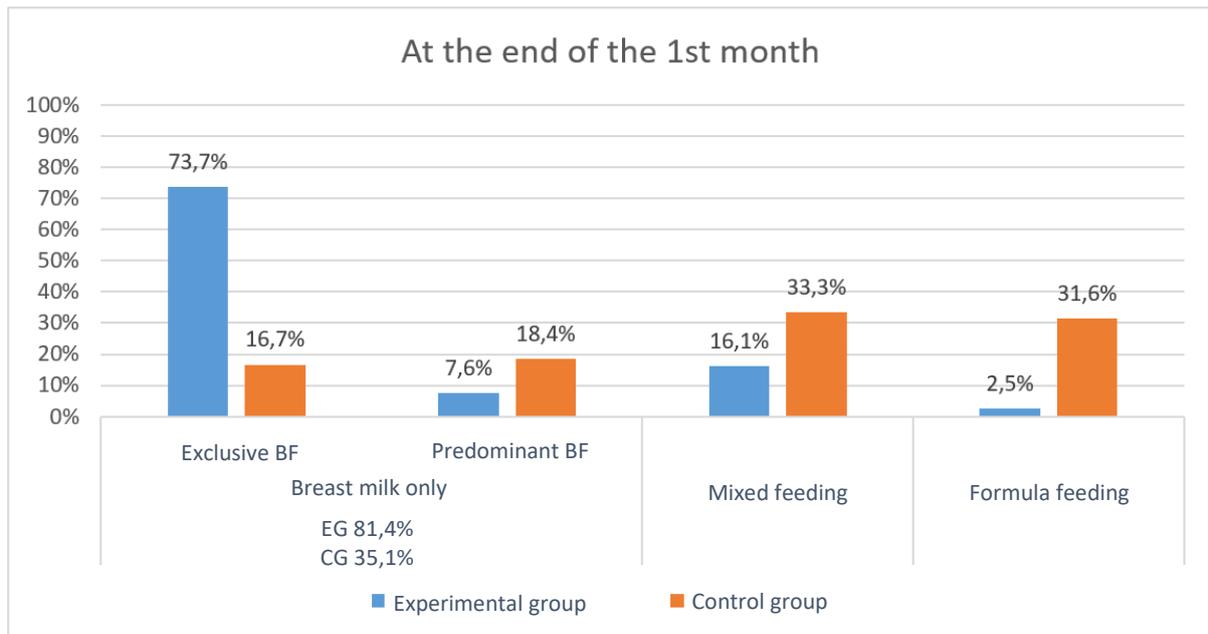
Figure 18. Distribution in the two groups according to the infant feeding pattern at the end of the first month

The Mann–Whitney results again show a significant difference (U = 10923, p<0.001) and the effect size increases further (d = 0.575) (Fig. 19). This underlines the increasing importance of ongoing postnatal support provided only to the EG.

Independent-Samples Mann-Whitney U Test

|	
Total N	232
Mann-Whitney U	10 923,000
Wilcoxon W	17 944,000
Test Statistic	10 923,000
Standard Error	478,826
Standardized Test Statistic	8,765
Asymptotic Sig. (2-sided test)	,000

Figure 19. Distribution in the two groups according to the infant feeding pattern at the end of the first month (Mann-Whitney test)

4.3. End of the sixth month:

At the end of the sixth month, the positive trend in EG persists (Fig. 20). The proportion of mothers who offer only breast milk as milk feeding remains close to the level at the first month, decreasing by only 3.4%. In contrast, although breastfeeding rates among those mothers in the CG who continue breastfeeding appear relatively stable, the overall feeding pattern shifts markedly towards breast milk substitutes.
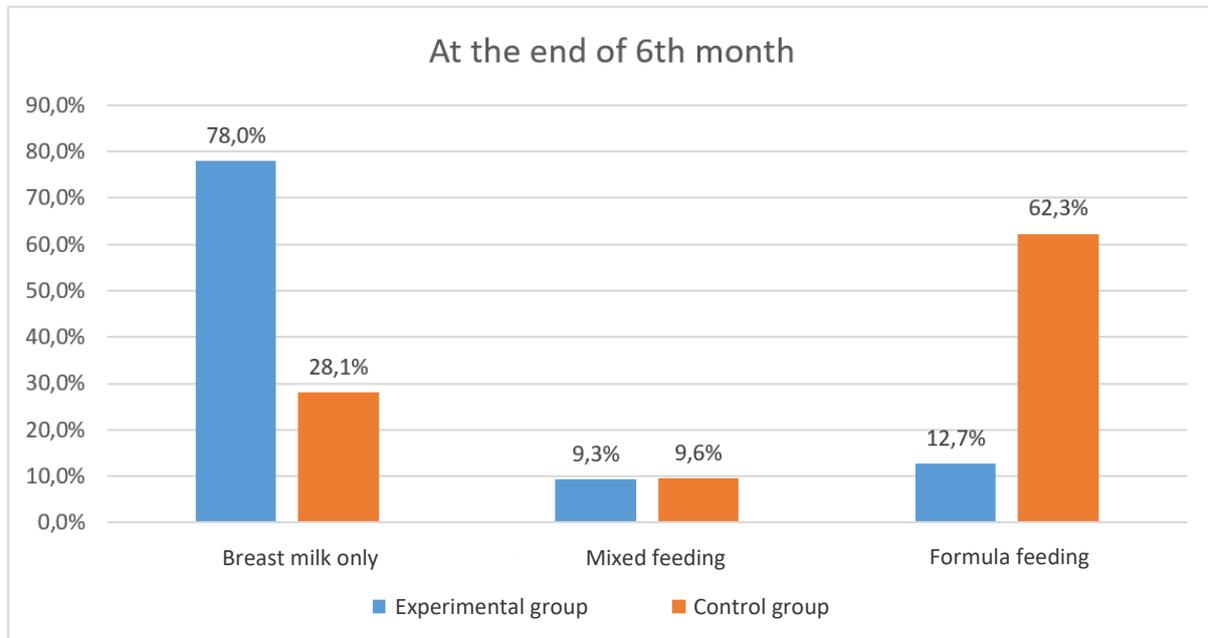
Figure 20. Distribution in the two groups according to the infant feeding pattern at the end of the sixth month

Substitute feeding increases more than twofold in the CG – from 31.6% to 62.3%. An increase is also observed in the EG, but to a much smaller extent (12 additional mothers transition to infant formula).

The Mann–Whitney test again shows significant differences (U = 10478, p<0.001), with the effect size (d = 0.520) remain moderately high (Fig. 21). This reflects the sustainability of the intervention and its continued influence on long-term breastfeeding maintenance.

Independent-Samples Mann-Whitney U Test

Group

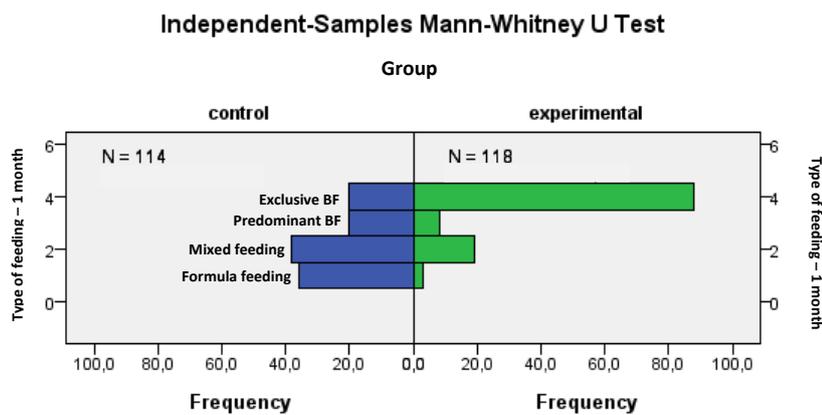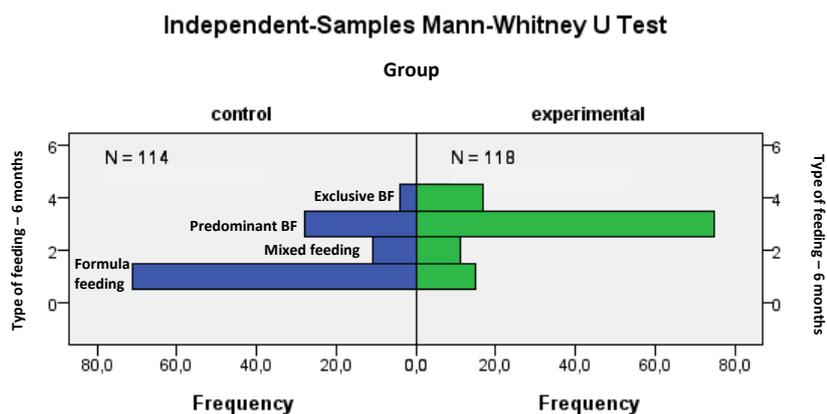| Total N	232
Mann-Whitney U	10 478,000
Wilcoxon W	17 499,000
Test Statistic	10 478,000
Standard Error	473,941
Standardized Test Statistic	7,917
Asymptotic Sig. (2-sided test)	,000

Figure 21. Distribution in the two groups according to the infant feeding pattern at the end of the sixth month (Mann-Whitney test)

Table 2. Distribution of feeding patterns by group and period of observation.

Period of observation	Pattern of feeding	Experimental group	Control group
First days Mann–Whitney U = 10070, p < 0.001, d = 0.475 (moderate effect).	Exclusive breastfeeding	78.0%	28.1%
	Predominant breastfeeding	4.2%	17.5%
	Mixed feeding	17.80%	45.6%
	Formula feeding	0%	8.8%
At first month Mann–Whitney U = 10923, p < 0.001, d = 0.575 (moderate/strong effect)	Exclusive breastfeeding	73.7%	16.7%
	Predominant breastfeeding	7.6%	18.4%
	Mixed feeding	16.2%	33.3%
	Formula feeding	2.5%	31.6%
At sixth month Mann–Whitney U = 10478, p < 0.001, d = 0.520 (moderate effect).	Exclusive breastfeeding	70.3%	11.0%
	Predominant breastfeeding	6.0%	3.0%
	Mixed feeding	6.8%	23.7%
	Formula feeding	16.9%	62.3%

The comparative analysis across stages demonstrates a clear, consistent, and statistically significant effect of the intervention in the experimental group at all observation points. The differences are already evident in the first days, intensify by the end of the first month, and remain sustained through the sixth month (Table 2).

5. Transition from one type of feeding to another (longitudinal analysis)

Longitudinally, breastfeeding was maintained from the first days until the end of the first month in 92.8% of mothers who started breastfeeding in the EG (n=97) and in 67.3% in the CG (n=52), At the end of the 6-month period, infants receive only breast milk as their milk feeding in 87.6% in the EG and 48.1% in the CG (Fig. 22).
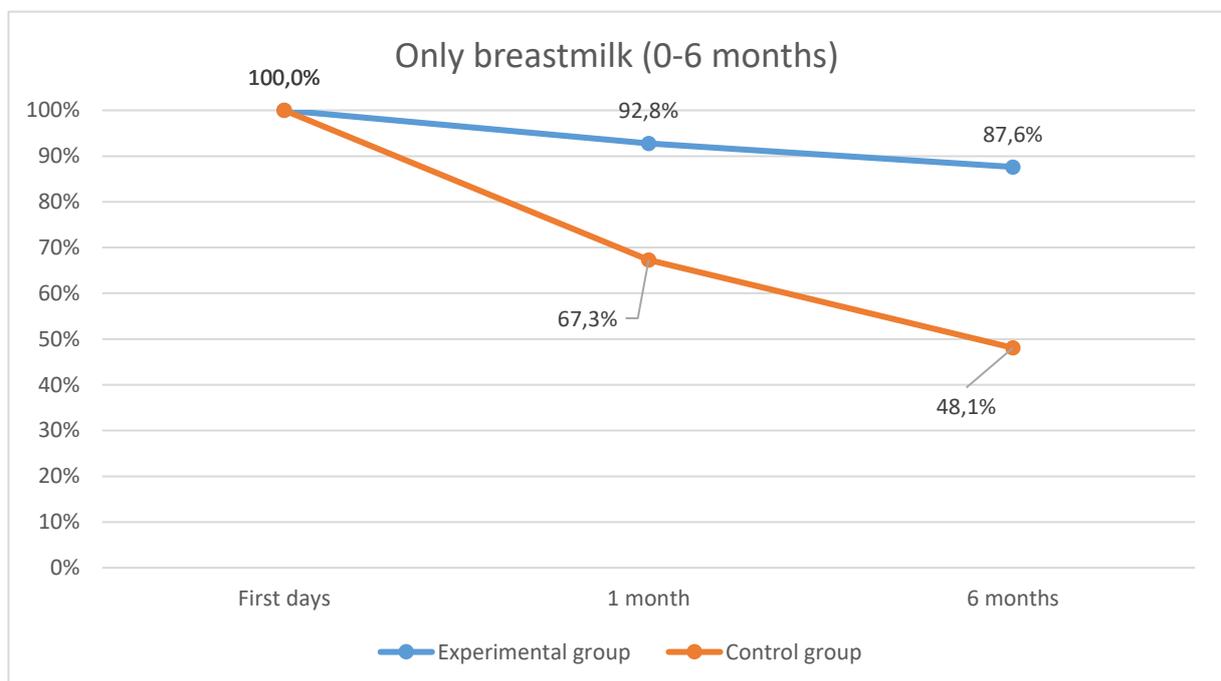
Figure 22. Trend in maintaining exclusive breastfeeding from the first days to 6 months in the two groups, longitudinally

Among mothers who begin with mixed feeding, substantial differences are also observed. A transition to exclusive breastfeeding is reported in 28.6% of mothers in the EG, compared with only 9.6% in the CG. In the longitudinal analysis of mothers practicing mixed feeding (n_{EG}=21, n_{CG}=52), a positive shift is identified in 28.6% of the EG and only 9.6% of the CG.

Figure 23 illustrates the proportions of mothers who transitioned from mixed feeding to another feeding (in either a positive or a negative direction) in both groups at the end of the first month.

From mixed to other feeding, 1st month -EG

- 9,5%
- 28,6%
- 61,9%

■ Exclusive breastfeeding ■ Mixed feeding
■ Formula feeding

From mixed to other feeding, 1st month - CG

- 9,6%
- 40,4%
- 50,0%

■ Exclusive+predominant BF ■ Mixed feeding
■ Formula feeding
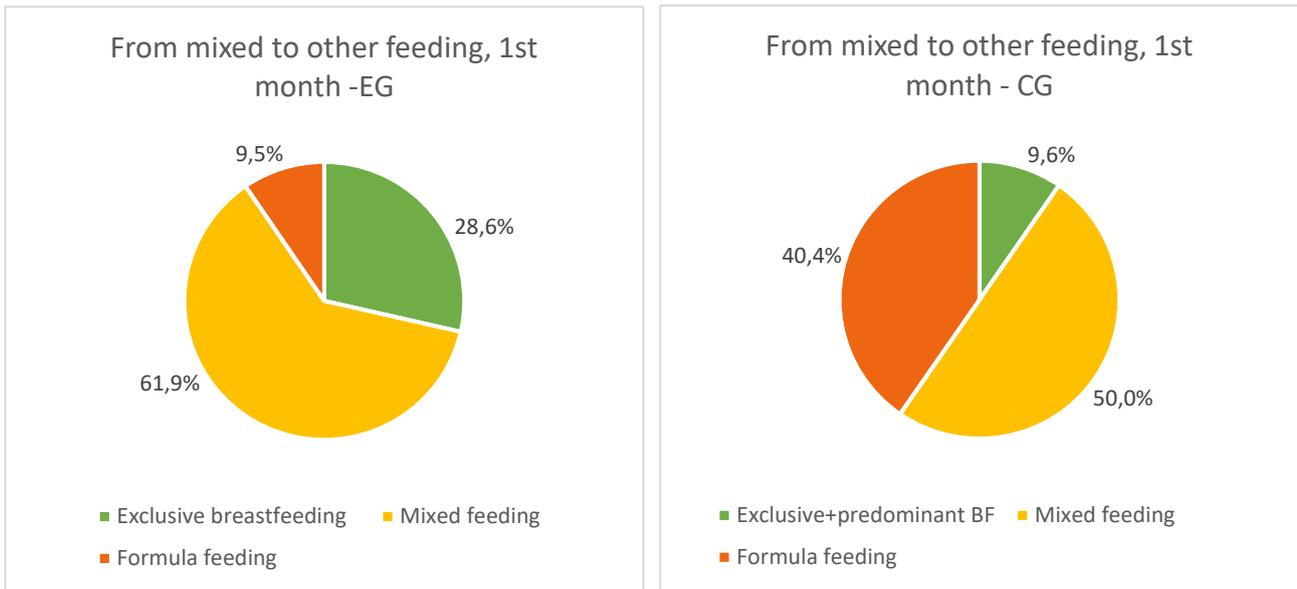
Figure 23. Transition from mixed to other feeding at the end of the first month in the experimental and control groups, longitudinally

The longitudinal data add depth to the overall picture, showing that the intervention supports the sustainability of individual feeding choices over time and facilitates better coping in cases of an unfavourable start.

6. Analysis of the impact of a set of clinical factors on breastfeeding success

To assess the relative contribution of different clinical and organizational practices to the likelihood of exclusive breastfeeding at the three observation points, three consecutive binary logistic regression models are conducted. The analyses include a set of variables selected for their theoretical significance, consistency with the WHO/UNICEF Ten Steps to Successful Breastfeeding, and preliminary statistical associations identified in the cross-tabulations.

The same independent variables are used in all three models (the variable for post-discharge counselling added only in the second and third stages), allowing their effect to be traced over time and their stability assessed. The entry method is *Enter*.

6.1. Clinical practices supporting breastfeeding success in the first days

Table 3. Results of binary logistic regression for factors influencing exclusive breastfeeding in the first days after discharge

Variable	B	S.E.	Wald	p-value	Exp(B)	95% CI Exp(B)	Statistical significance
Comprehensive set of BF support measures (EG)	1.175	0.431	7.415	0.006	3.237	1.390-7.537	significant
Time of initiation of breastfeeding	0.442	0.204	4.682	0.030	1.556	1.043- 2.322	significant
Assistance with first breastfeeding (all)	-	-	11.636	0.009	-	-	significant
Assistance with first breastfeeding (no, prior experience)	2.090	0.681	9.429	0.002	8.083	2.130- 30.682	significant
Assistance with first breastfeeding (no, but provided later)	0.538	0.712	0.571	0.450	1.713	0.424- 6.920	insignificant
Assistance with first breastfeeding (yes, provided)	0.476	0.577	0.680	0.410	1.610	0.519- 4.991	insignificant
Infant formula offering by hospital staff (all)	-	-	11.421	0.010	-	-	significant
Infant formula offering by hospital staff (on request)	0.136	0.526	0,067	0.796	1.145	0.408- 3.213	insignificant
Infant formula offering by hospital staff (offered but refused)	2.349	0.869	7.309	0.007	10.475	1.908- 57.506	significant
Infant formula offering by hospital staff (not offered)	1.367	0.606	5.090	0.024	3.922	1.197- 12.853	significant
Rooming-in	-0.103	0.430	0.057	0.811	0.903	0.389- 2.096	insignificant
Constant	-2.046	0.496	17.053	0	0.129		

The first model demonstrates very good predictive capacity ($\chi^2(9)=98.50$; $p<0.001$), explains up to 47% of the variance (Nagelkerke $R^2=0.467$), and correctly classifies 75.5% of cases. The Hosmer–Lemeshow test ($p=0.441$) indicates a good model fit.

Strongest independent predictors:

1. **Comprehensive set of BF support measures (belonging to the EG)**
   Participation in the EG increases the likelihood of exclusive breastfeeding by **3.24 times** (OR=3.237; 95% CI: 1.390–7.537; p=0.006). This confirms that the complex hospital intervention exerts a direct and strong effect even in the first few days.

2. **Early initiation of breastfeeding (Step 4)**
   Early contact increases the likelihood of exclusive breastfeeding by **56% for each step of improvement** in the indicator (OR=1.556; p=0.030). Its effect is pronounced and aligns with the findings of the cross-tabulations.

3. **Assistance with the first breastfeeding (Step 5)**
   The overall effect is significant (p=0.009). The effect is strongest among mothers who did not require assistance due to previous experience – they are **8.08 times** more likely to breastfeed exclusively (p=0.002). The other categories of assistance do not reach independent significance.

4. **Offering infants formula (Step 6)**
   The overall effect is significant (p=0.010).
   – *not offered:* OR=3.922 (p=0.024)
   – *offered but refused:* OR=10.475 (p=0.007)
   This emerges as one of the strongest predictors in the model.

Variables without independent significance at this stage

1. Rooming-in (Step 7)
2. Assistance with first breastfeeding in the "received immediately" or "provided later" categories

These results highlight the importance of comprehensive hospital support for mothers, early contact and limiting unnecessary formula offering in promoting exclusive breastfeeding.

6.2. Clinical practices supporting breastfeeding success at the end of the first month

Table 4. Results of binary logistic regression for factors influencing exclusive breastfeeding at 1 month.

Variables	B	S.E.	Wald	p-value	Exp(B)	95% CI Exp(B)	Statistical significance (cross-tabulations)	Statistical significance (logistic regression)
Comprehensive set of BF support measures (EG)	2.007	0.509	15.575	0	7.442	2.746-20.164	Yes (p < 0.001)	**Yes (p < 0.001)**
Time of initiation of breastfeeding	0.227	0.218	1.079	0.299	1.254	0.818-1.923	Yes (p < 0.001)	No (p = 0.299)
Assistance with first breastfeeding *(all)*	-	-	2.862	0.413	-	-	Yes (p = 0.004)	No (p = 0.413)
Assistance with first breastfeeding *(no, prior experience)*	0.473	0.662	0.511	0.475	1.605	0.439-5.872	-	No
Assistance with first breastfeeding *(no, but provided later)*	0.276	0.727	0.145	0.704	1.318	0.317-5.484	-	No
Assistance with first breastfeeding *(yes, provided)*	-0.303	0.580	0.274	0.601	0.738	0.237-2.299	-	No
Infant formula offering by hospital staff *(all)*	-	-	9.200	0.027	-	-	Yes (p < 0,05)	**Yes (p < 0.001)**
Infant formula offering by hospital staff *(on request)*	0.138	0.531	0.068	0.794	1.149	0.406-3.249	-	No
Infant formula offering by hospital staff *(offered but refused)*	1.344	0.646	4.332	0.037	3.835	1.082-13.599	-	**Yes (p < 0.05)**
Infant formula offering by hospital staff *(not offered)*	1.529	0.630	5.877	0.015	4.612	1.341-15.856	-	**Yes (p < 0.05)**
Rooming-in	-0.434	0.487	0.794	0.373	0.648	0.250-1.683	Yes (p < 0,001)	No
Counselling during the first month *(all)*	-	-	2.746	0.433	-	-	Yes (p < 0,001)	No

Variables	B	S.E.	Wald	p-value	Exp(B)	95% CI Exp(B)	Statistical significance (cross-tabulations)	Statistical significance (logistic regression)
Counselling during the first month *(remote)*	0.350	0.483	0.525	*0.469*	1.420	0.550-3.662	-	No
Counselling during the first month *(in person)*	0.698	0.596	1.372	*0.241*	2.009	0.625-6.457	-	No
Counselling during the first month *(both ways)*	-0.248	0.556	0.199	*0.656*	0.780	0.262-2.320	-	No
Constant	-1.748	0.471	13.766	*0*	0.174	-	-	-

The model is statistically significant ($\chi^2(12)=98.225$; $p<0.001$), with an explanatory power of Nagelkerke $R^2=0.466$ and high classification accuracy (79%). The Hosmer–Lemeshow coefficient ($p=0.144$) indicates a good fit.

Strongest predictor: comprehensive intervention

Participation in the EG increases the likelihood of exclusive breastfeeding at one month **more than sevenfold** (OR=7.442; $p<0.001$). The effect is stronger than in the early days, suggesting **cumulative positive influence over time**.

Other significant factors
Refraining from unnecessary formula offering remains influential in the first month, demonstrating that hospital practices have lasting effects beyond discharge:

- *not offered:* OR=4.612 ($p=0.015$)
- *offered but refused:* OR=3.835 ($p=0.037$)

Variables that lose significance
- early initiation is no longer an independent predictor ($p=0.299$)
- assistance during the first breastfeeding – the effect diminishes
- rooming-in – no significance
- counselling during the first month – still no independent effect ($p>0.05$)

At the end of the first month, two predictors remain dominant: the comprehensive hospital intervention and strict adherence to practices that avoid unnecessary formula offering.

6.3. Clinical practices supporting breastfeeding success at the end of the sixth month

Table 5. Results of binary logistic regression for factors influencing breastfeeding at 6 months.

Variables	B	S.E.	p-value	Exp(B)	95% CI Exp(B)	Statistical significance (cross-tabulations)	Statistical significance (logistic regression, 1 month)	Statistical significance (logistic regression, 6 month)
Comprehensive set of BF support measures (EG)	1.322	0.473	*0.005*	3.750	1.483-9.482	**Yes (p < 0.001)**	**Yes (p < 0.001)**	**Yes (p = 0.05)**
Time of initiation of breastfeeding	-	-	*0.603*	-	-	**Yes (p < 0.001)**	No (p = 0.299)	No (p = 0.603)
Assistance with first breastfeeding *(all)*	-	-	*0.486*	-	-	**Yes (p = 0.004)**	No (p = 0.413)	No (p = 0.486)
Assistance with first breastfeeding *(no, prior experience)*	0.286	0.591	*0.628*	1.332	0.418-4.243	-	No	No
Assistance with first breastfeeding *(no, but provided later)*	-0.630	0.668	*0.345*	0.532	0.144-1.970	-	No	No
Assistance with first breastfeeding *(yes, provided)*	-0.322	0.501	*0.521*	0.725	0.272-1.935	-	No	No
Rooming-in	0.392	0.431	*0.363*	1.479	0.636-3.443	**Yes (p < 0.001)**	No (p = 0.373)	No (p = 0.363)
Infant formula offering by hospital staff *(all)*	-	-	*0.212*	-	-	**Yes (p < 0.05)**	**Yes (p < 0.001)**	No (p = 0.212)
Infant formula offering by hospital staff *(on request)*	0.434	0.538	*0.420*	1.543	0.537-4.433	-	No	No
Infant formula offering by hospital staff *(offered but refused)*	0.423	0.613	*0.490*	1.526	0.459-5.071	-	**Yes (p < 0.05)**	No

Variables	B	S.E.	p-value	Exp(B)	95% CI Exp(B)	Statistical significance (cross-tabulations)	Statistical significance (logistic regression, 1 month)	Statistical significance (logistic regression, 6 month)
Infant formula offering by hospital staff *(not offered)*	1.341	0.636	*0.035*	3.821	1.098-13.298	-	**Yes (p < 0.05)**	**Да (p < 0.05)**
Counselling during the first month *(all)*	-	-	*0.083*	-	-	**Yes (p < 0.001)**	No (p = 0.433)	No (border value p = 0.083)
Counselling during the first month *(remote)*	0.663	0.451	*0.141*	1.941	0.802-4.696	-	No	No
Counselling during the first month *(in person)*	1.389	0.620	*0.025*	4.012	1.190-13.529	-	No	**Yes (p < 0.05)**
Counselling during the first month *(both ways)*	0.058	0.527	*0.913*	1.059	0.377-2.976	-	No	No
Constant	-1.229	0.409	*0.003*	0.293	-	-	-	-

The model is statistically significant (χ^2=78.419; p<0.001) explaining 38.8% of the variance (Nagelkerke R^2=0.388) with an overall classification accuracy of 76%.

Strongest predictor

The only independent and consistent predictor at all stages remains the comprehensive intervention (OR=3.75; p=0.005).

Other significant factors

- "In-person counselling during the first month" demonstrates a significant effect at this stage (p<0.05);
- Not offering infant formula (in the strictest category "not offered at all") retains a significant influence.

Variables that lose significance

Early initiation and assistance with the first breastfeeding no longer exert an independent effect.

Table 6. Summary of the logistic regression results for factors related to good clinical breastfeeding support practices.

Factor	Exclusive BF – early days	Exclusive BF – 1 month	Breastfeeding at 6 months	Comment
Comprehensive set of BF support measures (EG)	✔ p < 0.001	✔ p < 0.001	✔ p = 0.050	The only factor with consistent statistical significance at all stages, underscoring the impact of the systematic hospital intervention.
Early breastfeeding initiation	✔ p < 0.05	✘ p = 0.299	✘ He p = 0.603	Significance only in the early stage. The effect likely diminishes later due to the influence of other factors and reduced variation in the sample.
Assistance with first breastfeeding	✔ p = 0.009	✘ p = 0.413	✘ p = 0.486	Significant only in the first days, supporting the argument that continued support is necessary.
Rooming-in	✘ p = 0.811	✘ p = 0.373	✘ p = 0.363	No effect at all three stages, likely due to low variation within the sample and the need to be combined with other practices to fully demonstrate its effectiveness.
Infant formula offering by hospital staff	✔ p < 0.05	✔ p < 0.001	✘ p = 0.212 ✔ p < 0.05 (not offered)	Significant effect at the first two stages. Only the strictest "no offered at all" category retains a long-term effect.
Counselling during the first month	N/A	✘ p = 0.433	✘ p = 0.083 ✔ p < 0.05 (in person)	Significant only at 6 months, and specifically for the "in-person consultation" category, suggesting a cumulative effect and highlighting the importance of direct interpersonal communication for breastfeeding duration.

The combined results of the three models clearly demonstrate that sustained breastfeeding success depends on a combination of early hospital practices and continued post-discharge support.

The effect of the comprehensive intervention remains consistent across all periods. In the first few days, hospital practices – early initiation, support for the first breastfeeding, and avoiding supplements – are decisive for establishing lactation; the absence of supplements continues to have significant influence at the end of the first month; by the sixth month, in-person counselling emerges as an independent and significant factor, underscoring the importance of systematic follow-up care.

This dynamic interplay of factors shows that successful and sustained breastfeeding requires continuous, targeted and well-structured support for the mother.

MAIN CONCLUSIONS

Based on the *comparative analysis* of national breastfeeding protection, promotion, and support policies in Bulgaria and international health policies and practices, the following conclusions can be drawn:

Positive aspects:

➢ Bulgaria has strong regulatory provisions supporting breastfeeding in the workplace, including extended paid maternity leave, additional breastfeeding leave during working hours, and opportunities for fathers in supporting mothers during the early critical period.

➢ Policy documents include breastfeeding-related activities, primary health promotion oriented.

➢ Institutions and civil-sector organizations regularly conduct breastfeeding promotion activities.

➢ Within the National Programme for Improvement of Maternal and Child Health, health and prevention centres for maternal and child health have been established, with potential to provide quality breastfeeding support services to their target groups.

➢ There is a partial compliance with the International Code of Marketing of Breastmilk Substitutes; the Bulgarian Food Safety Agency is responsible for enforcing European regulations regarding infant food labelling.

➢ Several Bulgarian universities periodically offer elective or postgraduate courses on breastfeeding protection, promotion and support, as well as a one-year specialization for healthcare professionals in "breastfeeding and healthy and dietary nutrition consulting" as listed in the nomenclature of specialties in the healthcare system.

➢ The NGO sector offers high-quality, up-to-date and training for medical specialists (NABS courses based on the WHO/UNICEF programme and delivered by internationally accredited lecturers with extensive practical experience).

➢ A regulatory amendment has introduced formal provisions for patronage care for mothers of new-borns.

Negative aspects:

➢ There is no national policy document specifically dedicated to breastfeeding protection, promotion, and support. Existing action plans (NPPCHN, NPPMDZ, National Strategy for Child and Adolescent Health and Paediatric Care) include activities, but there is no systematic approach to addressing the problem – they lack strategic coherence, focus mainly on awareness-raising, and use indicators that do not measure quality or impact.

➢ No functioning coordinating body or national coordinator exists.

➢ Funding for breastfeeding-related activities is not prioritised.

- There is no effective mechanism for monitor compliance with the International Code of Marketing of Breastmilk Substitutes, which Bulgaria has ratified.
- The National Health Insurance Fund does not reimburse specialised breastfeeding support services in hospitals or outpatient care, including direct funding for the work of visiting midwives. There is no legally recognised clinical competence in lactation, limiting integration of breastfeeding services into clinical standards, accreditation, and reimbursement mechanisms. This limits the opportunities for specialists who have completed postgraduate specialization and hinders the sustainable development of support systems in hospital and outpatient care.
- The BFHI program is currently not implemented in Bulgaria, and hospitals are not incentivised by the state to meet this standard.
- Perinatal and postnatal services providing breastfeeding support during key periods are insufficient.
- There is no targeted state funding for monitoring and research.

Based on *the study* conducted to assess the effect of applying good clinical practices to support breastfeeding around the time of birth and during the first month, the following conclusions can be drawn:

- Standard health services in maternity wards in Bulgaria show substantially lower level of implementation of evidence-based breastfeeding support practices – breastfeeding within the first hour, 24-hour rooming-in of the mother and baby, breastfeeding guidance and general support for the mother during her hospital stay.
- When breastfeeding support measures are applied early, exclusive breastfeeding rates are significantly higher in the first days after discharge, at 1 month, and at the 6 months (between 2.5 and 4.5 times across all periods).
- With support, mothers more successfully overcome early challenges and transition from mixed feeding to full breastfeeding.
- Adequate and timely support from trained professionals remains a significant factor even among mothers with higher education – a known independent predictor for successful breastfeeding. Among mothers with lower education, the presence or absence of support has an even stronger impact.
- When previous breastfeeding experience is combined with adequate professional support, breastfeeding success rates are higher; first-time mothers need structured assistance even more.
- Caesarean delivery negatively affects breastfeeding success, but mothers who receive support in the first days and first month are more likely to maintain breastfeeding for six months.
- Regardless of place of birth (public/municipal or private hospital), the key determinant remains the availability of skilled professional support.

Based on the analysis of the set of clinical factors, the following conclusions can be drawn:

1. Effect of systematic hospital support (experimental group)

The most consistent and unequivocal finding is the sustained positive effect of structured support implemented in line with good clinical practices (experimental group). Compared with the CG, mothers in the EG demonstrate a significantly higher rates of exclusive breastfeeding (EBF) at all stages:

➢ **3.24 times** higher likelihood of EBF after discharge;
➢ **7.44 times** higher likelihood of EBF at the end of the first month;
➢ **3.75 times** higher likelihood of EB at six months.

These results support the effectiveness of integrated hospital interventions implemented in accordance with the principles of the Baby-Friendly Hospital Initiative (BFHI), and are consistent with international evidence highlighting the benefits of multicomponent programmes involving staff training, support for early breastfeeding, restricting the use of infant formula, and ensuring continuity of care.

2. Impact of specific clinical practices

Offering infant formula (Step 6)

Restricting the offering of infant formula is a key factor in achieving EBF. The data show that when infant formula is not offered (or when mothers refuse to use it), the likelihood of EBF are significantly higher—both in the first month and at the end of the sixth month. Only the most restrictive practice ("not offered at all") maintains a statistically significant long-term effect.

Early initiation of breastfeeding (Step 4)

Putting the baby to the breast within the first hour after birth has a significant impact on EBF in the first few days, but this effect diminishes over time. This underscores the critical importance of early contact for initiating lactation, while also highlighting the need for continued support to sustain it.

Assistance with the first breastfeeding (Step 5)

Assistance received during the first breastfeeding (particularly among mothers with previous experience) has a significant positive effect immediately after birth, but does not show a long-term impact. This is likely due to the fact that the quality of assistance is subjectively assessed and varies considerably depending on the context and staff training.

Rooming-in (Step 7)

Although rooming-in facilitates breastfeeding on demand and strengthens mother-infant bonding, it does not show a statistically significant effect in the logistic models. This may

be due to limited variability in the sample, as well as the need for this practice to be combined with other supportive measures in order for its full effectiveness to emerge.

<u>Importance of postnatal counselling support (Step 10)</u>

The role of post-discharge counselling becomes particularly evident in the longer term. While no statistically significant effect is observed at the end of the first month, at the end of the sixth month, mothers who have received at least one face-to-face consultation are **4.01 times more likely** to continue breastfeeding. This highlights the importance of direct, individualised support in building the skills and confidence needed to overcome later breastfeeding challenges. The absence of effect from remote consultations raises questions about their effectiveness as a standalone intervention.

The findings of this study clearly demonstrate that:

➤ A structured model of hospital and early postnatal support has the broadest and most consistent impact on breastfeeding and should be considered a central element in strategies aimed at promoting breastfeeding.
➤ The most effective interventions combine: limiting the availability of breastmilk substitutes, early initiation of breastfeeding, rooming-in, and accessible counselling support both during the hospital and after discharge.
➤ The effect of early practices (early initiation, assistance with the first breastfeeding) is particularly strong in the first few weeks, but maintaining breastfeeding requires ongoing support, especially in the form of in-person counselling.

In conclusion, Bulgaria meets some of the recommendations in the European Blueprint for Action. Progress is most evident in areas of legislative protection for working mothers and civil society initiatives. However, substantial gaps remain in strategic planning, training, coordination, clinical and community support, and monitoring. An integrated policy based on international recommendations, supported by clearly defined responsibilities and funding, is needed to ensure effective protection, promotion, and support of breastfeeding in Bulgaria.

The impact assessment of the implementation of good clinical practices confirms the positive effect of using a clinical model based on the 10 Steps to Successful Breastfeeding – a necessary component of the broader system of measures aimed at improving the prevalence and duration of breastfeeding in Bulgaria. The results should be considered within the context of established international practices and can inform practical recommendations for hospitals as well as policies supporting maternal and child health.

RECOMMENDATIONS

Based on previous national experience and international recommendations regarding models of national policies, it is necessary to develop a new national policy specifically aimed at protecting, promoting, and supporting breastfeeding.

Proposed set of measures to be included in a new national health policy model for the protection, promotion, and support of breastfeeding

1) **Strategic review and adaptation of good practices from countries with well-established systemic policy models for the protection, promotion, and support of breastfeeding** (e.g., Croatia, Slovenia, Norway, Ireland, Germany, etc.).

As an initial phase of national action, it is essential to study the accumulated experience of countries in the region with a similar socio-economic context and health system structure, which have already developed effective breastfeeding-support policies (e.g., Croatia and Slovenia).

The aim of this review is to:

➢ identify *effective models for coordination and governance*, including national councils or inter-institutional mechanisms;
➢ examine practices for *the sustainable implementation of initiatives such as BFHI*, including their financing and oversight;
➢ analyse the integration of breastfeeding within *primary health care and home-visiting services*;
➢ review functioning mechanisms for *monitoring, data collection, and use of breastfeeding-related data*;
➢ examine the role of *training for health professionals* and *civil society organizations*.

Such an approach would enable the adaptation of successful interventions to the Bulgarian context, support the justification of policy priorities, and establish a solid platform for advocacy, partnership, and intersectoral coordination.

2) **Political commitment and coordination of efforts**
➢ *Development and adoption of a National Programme for the Protection, Promotion, and Support of Breastfeeding* with an action plan incorporating elements from the Blueprint for Action in Europe (2008), updated global recommendations, and successful regional good examples.
➢ *Re-establishment of the National Breastfeeding Committee (NBC)* at the Ministry of Health as a multi-stakeholder, cross-sectoral, and multidisciplinary body with clearly defined mandates and responsibilities, including:
   o *Strategic planning*:

- Developing and updating the National Programme with clear, measurable, and realistic goals (e.g., "increasing the proportion of exclusively breastfed infants up to 6 months of age to ...% by 2030").
- Preparing annual action plans with specific tasks, deadlines, and responsible institutions.

o *Coordination and harmonization*:
- Ensuring cooperation between ministries, agencies, hospitals, and NGOs to avoid duplication of efforts and create synergy.
- Monitoring alignment between national policies in other sectors (e.g., labour legislation) and breastfeeding objectives.

o *Standardization and methodological support:*
- Coordinating and monitoring the implementation of the BFHI nationally.
- Developing national clinical guidelines, standards of care, and training materials for health professionals.
- Functioning as a national expert centre offering methodological support to healthcare facilities and professionals.

o *Monitoring, evaluation, and reporting:*
- Defining key indicators for tracking progress.
- Coordinating the collection of reliable data on infant feeding practices in the country in collaboration with the National Health Insurance Fund, the National Center for Public Health and Analyses, and the National Statistical Institute.
- Preparing annual progress reports with identified challenges and recommendations for improvement to ensure transparency and public accountability.

o *Oversight of the implementation of legislation:*
- Monitoring compliance with the International Code of Marketing of Breastmilk Substitutes and the national legislation, in cooperation with the Bulgarian Food Safety Agency (BFSA).
- Reviewing complaints regarding violations and recommending sanctions.

➢ *Ensuring long-term sustainable and targeted public funding* for the implementation of the National Programme for the Protection, Promotion, and Support of Breastfeeding and for the functioning of the NBC.

3) **Sustainable implementation of good clinical practices in hospital care**
➢ *Restoration and institutionalization of BFHI* through:
o support for re-accreditation of hospitals;
o simplified administrative procedures;
o regular monitoring and external assessment;
o institutional incentives for hospitals completing external evaluation.

- *Standards for good practice and implementation of the Ten Steps*, including antenatal breastfeeding counselling, early initiation of breastfeeding and skin-to-skin contact, rooming-in, and limiting the routine offering of infant formula.
- *Regulation of clinical specialties and clinical competencies* necessary for a sustainable breastfeeding-support model, including:
  - Establishing a formally recognised clinical competency in lactation for midwives, nurses, obstetrician-gynaecologists, neonatologists, and paediatricians through amendments to Regulation No. 1.
  - Developing a national clinical standard or clinical module for diagnostic and therapeutic support in breastfeeding difficulties.
  - Linking competence requirements to accreditation standards for healthcare facilities, especially maternity and neonatal units.
  - Introducing a new reimbursable health service, "breastfeeding consultation," with a defined scope, code, and provider requirements, enabling funding from the National Health Insurance Fund.
- *Staff training in maternity and neonatal departments* with a focus on individualised support and avoidance of harmful interventions (e.g., unnecessary formula supplementation).

4) Postnatal support and continuing care

- Implementation of a *national model for home-visiting services* as an effective form of breastfeeding support and referral to specialised care when needed.
- Establishment and *institutionalization of breastfeeding consultation rooms* in hospitals and outpatient facilities, funded by the National Health Insurance Fund.
- *Specialised breastfeeding training* for all professionals working with pregnant women, mothers, and young children, as well as for those providing counselling on the subject—in university curricula, postgraduate programmes, and workplace training.
- Inclusion of *breastfeeding consultations within the primary outpatient care* as a coded and traceable service. (Activities to promote breastfeeding in obstetric and general practice care currently exist in the National Framework Agreement, but require further development and specification as a separate, traceable advisory service providing systematic support for mothers in the postnatal period.)

5) Awareness and community engagement

- Developing and implementing *a communication strategy* on the benefits of breastfeeding and available health and community support services.
- Strengthening *partnerships with civil society organizations* working through "mother-to-mother support" community approaches, including those focusing on vulnerable groups.
- Incorporating *breastfeeding education into school health education programmes* within the parenting-related topics.

6) Monitoring, research, and reporting

➢ Incorporating *key internationally comparable breastfeeding indicators* into national health statistics and e-health systems.

➢ Conducting *regular nationally representative surveys* to monitor key breastfeeding indicators.

➢ Using monitoring and research data for *planning, advocacy, and reporting* on strategic goals.

A comprehensive model of this kind would transform the current fragmented efforts into a unified, coherent, and sustainable public policy with clear responsibilities and measurable outcomes.

CONTRIBUTIONS

Scientific contributions

1) **A comparative analysis is conducted between the health policies and practices outlined in the Blueprint for Action for the Protection, Promotion, and Support of Breastfeeding in Europe and the current situation in Bulgaria**, identifying progress and gaps at the political, institutional, and practical levels—for the first time in Bulgaria.

2) **A study is carried out, providing an analysis and assessment of the overall impact of hospital practices based on the Ten Steps to Successful Breastfeeding on breastfeeding outcomes**. A unified analytical model traces the effect of good clinical practices – such as early initiation of breastfeeding, limiting routine formula use during the hospital stay, rooming-in, support during the first breastfeeding and post-discharge counselling – on exclusive breastfeeding in the first days, at one month and at six months.

3) **Predictors with the strongest prognostic effect on breastfeeding duration are identified**, based on established models with good explanatory capacity and internal consistency.

4) **An assessment of the current situation regarding breastfeeding practices in maternity wards is conducted, including the periodic monitoring after hospital discharge.**

Applied contributions

1) **Proposals are formulated for a system of strategic, programmatic, and practical measures** to create a sustainable national model for the protection, support, and promotion of breastfeeding, in line with good European practices.

2) **A comparison is made between policy documents, strategic frameworks, and actual practices in Bulgaria and other European countries**, allowing for the identification of gaps and opportunities for the transfer of proven approaches.

3) **The results obtained provide an empirical basis for updating health policies** and clinical protocols in maternity care through evidence-based proposals oriented towards practice and opportunities for implementation in the Bulgarian context.

PUBLICATIONS AND SCIENTIFIC FORUMS PARTICIPATION RELATED TO THE DISSERTATION

1. Kandilarova-Georgieva S. Prevention of non-communicable chronic diseases through breastfeeding support and its place in community and social work. In: Proceedings of the Jubilee Conference *"Social Work – Past, Present, Future"*. Blagoevgrad: South-West University "Neofit Rilski"; 2021. p. 244. ISBN: 978-954-00-0309-2.
2. Kandilarova-Georgieva S. The success of Norway's health policy model for the protection, support, and promotion of breastfeeding. *Bulgarian Journal of Public Health*. 2023;15(4):68–76. ISSN: 1318-860X.
3. Kandilarova-Georgieva S. International policies for the protection, support, and promotion of breastfeeding—development and current trends. *Bulgarian Journal of Public Health*. 2024;16(2):5–18. ISSN: 1318-860X.
4. Kandilarova-Georgieva S. Effectiveness of good clinical practices for successful breastfeeding in Bulgaria. In: Abstract Book of the 8th Scientific Conference with International Participation *"Public Health: Interdisciplinarity, Policies and Quality"*. Blagoevgrad: Bulgarian Public Health Scientific Society; 2025. p. 23.

Citation of a publication related to the dissertation

Atias K. Predictors of exclusive breastfeeding. *Nursing Care*. 2025;57(2):12–21. ISSN: 1310-7496.

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