Original research article

Multifactorial analysis of sociodemographic and nursing factors in the context of nutritional management of preterm infants: A longitudinal study

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Abstract

Goals: This study aims to identify sociodemographic predictors of breastfeeding and evaluate the effect of nursing interventions on nutritional strategies in premature infants (0–6 months).
Methods: A prospective monocentric longitudinal study focused on the nutritional management of 201 preterm infants. Monitoring was performed for two years at specific time intervals.
Results: The mother's nationality influences the child's nutrition in the first weeks but this influence decreases with the child's age. The mother's education has a significant effect on nutritional choices. Higher education correlates with using different nutritional combinations. Strong predictors of breastfeeding include the first latch, skin-to-skin contact, and orofacial stimulation.
Conclusion: The study identified vital factors influencing the nutrition of preterm infants. These findings enable better targeting of measures and support better health and development of such children. The results provide a scientific basis for the development of nutritional strategies and interventions.

Keywords: Longitudinal study; Multifactorial analysis; Nursing interventions; Nutritional management; Preterm infants; Sociodemographic factors

Introduction

The care of premature newborns in individual countries has always been considered one of the crucial indicators of healthcare level. Monitoring current data from this area is vital for many healthcare and other professions (Hanzl and Pudíková, 2011). The nutritional management of preterm infants is a complex and multidisciplinary task with long-term implications for health and development (Burklow et al., 2002). Although there are research papers devoted to this issue, there is still room for a deeper understanding of how sociodemographic and nursing factors influence the nutritional strategies and health of premature newborns. Since the nutritional care of premature babies is very specific and can be influenced by several factors, it is necessary to conduct comprehensive and long-term studies for a deeper understanding of this issue. There are few detailed Czech studies focusing on the relationship between sociodemographic characteristics and nursing interventions from the point of view of nutritional management.

This study aims to identify sociodemographic breastfeeding predictors and evaluate the impact of nursing interventions on nutritional strategies in preterm infants in the first half of infancy (0–6 months after birth). We aim to determine how the mother's nationality, education, and nursing interventions influence feeding strategies. Human breast milk is widely recognised as an ideal source of nutrition for newborns, especially preterm infants (Boquien et al., 2018). Breastfeeding is recommended to start within the first hour after birth, and exclusive breastfeeding is recommended until the sixth month of life (Boquien, 2018; Burklow et al., 2002). Exclusive breastfeeding brings several positive health effects, including protection against infectious diseases, promoting proper development of teeth and jaws, increasing intellectual abilities, and reducing the risk of obesity and diabetes in later years (Naja et al., 2022; UNICEF, 2022).

Disturbingly, the incidence of premature births is still relatively high. About a tenth of all babies are born prematurely, *i.e.,* before completing the 37th week of pregnancy (Blencowe et al., 2012). In the Czech Republic, this share is slightly lower but still significant. In Europe, considerable health efforts are focused on improving preterm infants' survival rate, but comprehensive, systematic long-term care is insufficient.

We must research the effect of various factors across all socio-economic groups, including the socially disadvantaged, on breastfeeding success and duration. This could help healthcare

professionals create targeted interventions to promote breast-feeding. This study aims to identify and analyse sociodemographic and health-social factors that influence breastfeeding patterns in preterm infants during the first six months of life.

Objectives
We mainly focused on studying socio-demographic indicators and evaluating the influence of nursing interventions on nutritional strategies applied to premature babies during the first semester of the infant stage (0–6 months of postnatal development).

Materials and methods

Study design
This empirical research used quantitative methods. We conducted a prospective longitudinal study with a single data collection centre. The research was conducted in the Neonatology Department of Nemocnice České Budějovice, a. s. This department is comprehensively equipped. It includes the Physiological Newborns Care Department, Intensive and Resuscitation Care Unit, two intermediate care stations, a developmental clinic, and a breast milk bank. The research phase was carried out between January 2020 and December 2022.

Inclusion and exclusion criteria
Inclusion criteria
As part of the research, we monitored 201 premature babies born between the end of the 33rd week and the beginning of the 37th gestation week at the Neonatology Department at Nemocnice České Budějovice, a. s. This healthcare institution deals with 40 to 50 newborns per year on average. The longitudinal study included only premature newborns, and longitudinal analysis was carried out between 2020 and 2022.

Exclusion criteria
Newborns with severe birth defects, complications associated with gastrointestinal surgery, and those with severe cranial and pulmonary morbidity were excluded from this study. Specifically, these are children with severe bleeding into the central nervous system and children diagnosed with a severe form of bronchopulmonary dysplasia. Newborns with pathological conditions incompatible with life support were also excluded from the research.

Measures
Independent sociocultural variables
We monitored the socio-cultural demographics of the mothers, *i.e.*, their age, nationality, family status, highest level of education, employment category, and type of work before the current maternity leave, number of family members, place of residence, health history, the course of the last pregnancy and childbirth. We examined the number of pregnancies, births, children, abortions, and the way the pregnancy was terminated, whether it was a spontaneous birth or a caesarean section.

Independent intervention variables
As part of the nursing interventions, the support of lactation and breastfeeding, we monitored whether the first attachment to the breast occurred within half an hour after birth, skin-to-skin contact in the delivery room, non-nutritive attachment to the breast in the delivery room, or whether the mother applied colostrum no later than two hours after birth. We also examined whether the mother was educated by a lactation consult-ant, or whether orofacial stimulation and regular contact with the mother – skin-to-skin contact were carried out during hospitalisation. The composition of the infants' diet and administration method were evaluated. We monitored whether the children were only breastfed, given infant formula (artificial formula), or a combination of both, or they were fed only formula (substitute milk infant formula from a bottle) using a tube, a dropper, or a beaker.

Dependent variables
The dependent variables included infant feeding type and method. The feeding method of premature babies was monitored on the 7th, 14th, and 21st days, and the 3rd and 6th months. We monitored whether the children were only breastfed, given infant formula (artificial formula), or a combination of both, or they were fed only formula (substitute milk infant formula from a bottle) using a tube, a dropper, or a beaker. We assessed the feeding type and method of premature babies on the 7th, 14th, and 21st days, and in the 3rd and 6th months.

Data collection
During the hospitalisation of the children in the Neonatology Department, we obtained relevant data on premature children from the medical records. After their subsequent discharge from the hospital, these children were monitored through the Centre for Developmental Care at the Neonatology Department of the Nemocnice České Budějovice, a. s. Personal communication was established with most mothers, who voluntarily provided updates and information about their children through telephone calls, personal meetings, or online communication. The monitoring of the children was continuous, starting at birth and lasting until they were six months old. To ensure a high reliability and validity of the data, we performed an ongoing audit of record correctness, specifically for 10% of the total number of medical records.

Data analysis
A research project studying the relationships between socio-demographic factors and nutritional patterns of newborns used quantitative data analysis using SASD (Statistical Analysis Software for Data) statistical software. The methodology was designed to provide robust results. All data were anonymised and coded before entering the SASD statistical software. The data analysis had several stages. First, we performed descriptive statistics to obtain a basic overview of the distribution of variable values. We then used inferential statistical methods, such as chi-square tests for categorical variables. Results were interpreted considering *p*-values and considered statistically significant if the *p*-value was less than 0.05. Furthermore, we used multivariate analysis methods to identify potential interactions between variables. Overall, the methodology was designed to be as objective as possible, with reliable statistical tools for data analysis and interpretation. The use of the SASD program ensured that the entire analysis process was efficient and reproducible, contributing to the scientific result value.

Ethical approval
Only children whose mothers agreed to the medical records being looked at and agreed to the research investigation were included. The study was approved by the Ethics Committee of the Faculty of Health and Social Sciences of the University of South Bohemia in České Budějovice on 19th October 2020 (in accordance with the Declaration of Helsinki (WMA, 2022). Consent for research at the Nemocnice České Budějovice, a. s., Czech Republic, was approved on 25th October 2020.

Results

We analysed the sociodemographic data of 201 mothers in our group. This is shown in Table 1. The mothers were Czech (74.6%), and Roma (16.9%); the group also included a low number of other nationalities. Most mothers had high school (29.4%) and higher education (29.4%). The economic status before delivery shows that most mothers had a full-time job (60.1%). 65.7% of mothers were married, and 19.4% lived with a partner. Regarding the work type, the percentage of intellectual (33.8%) and manual jobs (32.8%) was almost equal, and a combination of both occurred in 19.9% of cases. Most female respondents lived in a block of flats (37.3%) or a house (37.3%). Regarding the delivery method, caesarean sections prevailed (55.2%) versus vaginal delivery (44.8%). These data provide a comprehensive view of the respondents' sociodemographic characteristics and serve as a basis for further analytical and scientific work.

Table 1. Basic sociodemographic information of the mothers in our dataset					
Nationality of mothers	N	%	Maternal education	N	%
Czech	150	74.6	Basic education	25	12.4
Slovak	7	3.5	High school without graduation	51	25.4
Ukrainian	2	1.0	Secondary school with graduation	59	29.4
Roma	34	16.9	Tertiary professional education	6	3.0
Vietnamese	3	1.5	Higher education	59	29.4
Other	5	2.5	Other	1	0.4
Total	201	100.0	Total	201	100.0
Economic status before childbirth	N	%	Marital status	N	%
Unemployed	36	17.9	Married	132	65.7
Housewife	16	8.0	Divorced	6	3.0
Student, apprentice	3	1.5	Unwed	24	11.9
Full-time employed	121	60.1	In unmarried cohabitation	39	19.4
Part-time employment	12	6.0	Total	201	100.0
Self-employed entrepreneur	11	5.5			
Irregular employment	2	1.0	Type of work	N	%
Total	201	100.0	Intellectual	68	33.8
			Manual	66	32.8
			Combined	40	19.9
Place of residence	N	%	No response	27	13.5
Prefabricated house (housing estate)	75	37.3	Total	201	100.0
Apartment building	40	19.9			
Home	75	37.3	Method of childbirth	N	%
Hostel	9	4.5	Vaginal birth	90	44.8
Other	2	1.0	Caesarean section (s.c.)	111	55.2
Note: N = absolute frequency; % – relative frequency.					

The type of nutrition was monitored through a nominal variable and their individual answers: formula for premature babies – other formulas – breast milk – other's breast milk – combination. The feeding method was monitored using a six-point scale: breastfeeding only – breastfeeding + tube – drip-feeding – breastfeeding + alternative feeding (beaker, finger syringe) – breastfeeding + bottle (VM/UM) – bottle formula only. If there were no observations in a grade, it was not included in the analysis. The evaluation of statistically significant connections between the mother's nationality and the feeding type and method is shown in Table 2.

On the 14th day of hospitalisation, we identified a statistically significant association between the mother's nationality and the nutrition type ($p < 0.001$). We found that Czech mothers used foreign breast milk significantly more often, while Roma mothers preferred other formulas. Mothers of other nationalities did not use formulas for premature babies at all. On the 21st day of hospitalisation, we found statistical significance of $p < 0.05$ again. In this phase, Czech mothers significantly more often used a combination of different types of nutrition, while Roma mothers significantly more often chose other formulas. Mothers of other nationalities significantly preferred their own breast milk or the combination at this stage. During the first week after birth, statistical significance was also noted in the method of feeding ($p < 0.05$). Czech mothers supplemented breast-feeding with a tube and used alternative complementary feeding less often. A statistical significance of $p < 0.05$ was found in the first 21 days. During

Table 2. The connection between the mother's nationality and the feeding type and method

The connection between the mother's nationality and the feeding type and method	Value χ^2	df	p	Stat. sign.
Nutrition type at the 1st week of hospitalisation	9.471	6	0.149	n.s.
Nutrition type at 14 days of hospitalisation	33.977	8	<0.001	***
Nutrition type at 21 days of hospitalisation	18.359	8	<0.05	*
Nutrition type at 3 months	14.607	8	0.067	n.s.
Nutrition type at 6 months	12.996	8	0.112	n.s.
Nutrition method at 7 days	18.985	10	<0.05	*
Nutrition method in the first 14 days	14.316	10	0.159	n.s.
Nutrition method in the first 21 days	17.976	8	<0.05	*
Nutrition method at 3 months	11.878	6	0.065	n.s.
Nutrition method at 6 months	10.874	10	0.367	n.s.

Note: χ^2 – chi-square; p – significance level; df – degree of freedom; n.s. – statistically insignificant difference; * statistically significant difference for significance level α = 0.05; *** statistically significant difference for significance level α = 0.001.

this period, Czech mothers supplemented breastfeeding, and Roma mothers chose bottle-feeding formula. Mothers of other nationalities significantly more often either only breastfed or supplemented the feeding with a bottle. These results suggest that national differences may play a crucial role in child-feed-ing preferences and practices. These findings should be considered in healthcare practice and the development of targeted interventions. The evaluation of statistically significant connections between the mother's education and the type and method of child nutrition is shown in Table 3.

Table 3. The connection between the mother's education and the type and method of child nutrition

The connection between the mother's education and the type and method of child nutrition	Value χ^2	df	p	Stat. sign.
Nutrition type in the 1st hospitalisation week	8.899	6	0.179	n.s.
Nutrition type in the first 14 days	26.662	8	<0.001	***
Nutrition type in the first 21 days	15.884	8	<0.05	*
Nutrition type at 3 months	11.169	8	0.192	n.s.
Nutrition type at 6 months	18.577	8	<0.05	*
Nutrition method at 7 days	14.642	10	0.146	n.s.
Nutrition method in the first 14 days	17.792	10	0.059	n.s.
Nutrition method in the first 21 days	20.659	8	<0.01	**
Nutrition method at 3 months	8.655	6	0.194	n.s.
Nutrition method at 6 months	15.431	10	0.117	n.s.

Note: χ^2 – chi-square; p – significance level; df – degree of freedom; n.s. – statistically insignificant difference; * statistically significant difference for significance level α = 0.05; ** statistically significant difference for significance level α = 0.01; *** statistically significant difference for significance level α = 0.001.

Based on the data analysis, we found variability in the relationship between the mother's education and the type or method of feeding in different phases of the child's first year of life. We identified a statistically significant association between maternal education and type of feeding at 14 days (p < 0.001), 21 days (p < 0.05), and six months of the child's age (p < 0.05). On the contrary, this connection was not statistically significant (p = 0.179 and p = 0.192) in the first week and three months of the child's age. Mothers with secondary and higher education significantly more often preferred a combination of different types of nutrition. In comparison, mothers with less education at 21 days and six months of the child's age more often chose other nutrition formulas. At six months, we observed that mothers with higher education were significantly more likely to breastfeed. Regarding the feeding method, we identified a statistically significant association in the first 21 days (p < 0.01). Here, mothers with primary and vocational education chose bottled formula more often, while mothers with secondary education more often preferred breastfeeding supplemented with alternative complementary foods. These findings underline the importance of the mother's education as a crucial factor in the decision-making process regarding the child's nutrition, especially in the first weeks and months of life. The data provide valuable information for creating targeted educational and support programs to help mothers optimise their children's nutritional habits from birth.

Table 4. The connection between the first contact of the newborn with the breast, skin-to-skin contact in the delivery room, and the feeding type and method

The connection between the first contact of the newborn with the breast, skin-to-skin contact in the delivery room, and the feeding type and method	Value χ^2	df	p	Stat. sign.
Nutrition type in the 1st hospitalisation week	4.508	3	0.212	n.s.
Nutrition type in the first 14 days	24.222	4	<0.001	***
Nutrition type in the first 21 days	17.469	4	<0.01	**
Nutrition type at 3 months	14.597	4	<0.01	**
Nutrition type at 6 months	17.695	4	0.103	n.s.
Nutrition method at 7 days	53.431	5	<0.001	***
Nutrition method in the first 14 days	27.793	5	<0.001	***
Nutrition method in the first 21 days	15.712	4	<0.01	**
Nutrition method at 3 months	13.834	3	<0.01	**
Nutrition method at 6 months	7.539	5	0.184	n.s.

Note: χ^2 – chi-square; p – significance level; df – degree of freedom; n.s. – statistically insignificant difference; ** statistically significant difference for significance level α = 0.01; *** statistically significant difference for significance level α = 0.001.

We found a statistically significant connection between the first contact with the breast and skin-to-skin contact in the delivery room and the type and method of feeding the child in several phases of the first year of life. Specifically, we identified a significant association at 14 days of hospitalisation, when infants who had skin-to-skin contact shortly after birth and were attached to the breast were more likely to be breastfed ($p < 0.001$). At 21 days, the association was also significant ($p < 0.01$), like that at 3 months of the child's age ($p < 0.01$). Regarding nutrition, there was a statistically significant association in the first 7 days ($p < 0.001$), 14 days ($p < 0.001$), 21 days ($p < 0.01$), and 3 months ($p < 0.01$). On the contrary, in the first week and at 6 months, the association was not statistically significant. These findings emphasise the importance of immediate skin-to-skin contact and the first attachment to the breast after birth for the subsequent development of the child's feeding habits. It seems that the first interaction can have a significant impact on whether mothers breastfeed or choose other forms of nutrition, especially in the first weeks and months of life.

Non-nutritive attachment to the breast in the delivery room was monitored using two scale items (yes – occurred, no – did not occur). The evaluation of statistically significant associations between non-nutritive attachment to the breast and feeding type and method is shown in Table 5.

On the 14th day, the value was lower than 0.001, and, on the 21st day, the p-value was lower than 0.01. These findings clearly indicate a statistically significant relationship between non-nutritive intake and the nutrition type at early life stages. Regarding the nutrition type, the statistical significance was very high in the first week ($p < 0.001$) and the first 14 days ($p < 0.001$). On the 21st day and the third month, p-values were lower than 0.01 and 0.05, indicating mild to moderate statistical significance. Based on these results, nursing staff, paediatric nurses, and lactation consultants should consider emphasising the importance of non-nutritive breast attachment immediately after birth. This procedure can have a striking effect, especially in the first weeks of life, as shown by the results with a p-value lower than 0.001 (Table 6).

Table 5. The connection between the non-nutritive attachment to the breast in the delivery room and feeding type and method

The connection between the non-nutritive attachment to the breast in the delivery room and feeding type and method	Value χ^2	df	p	Stat. sign.
Feeding type in the first week	5.627	3	0.131	n.s.
Feeding type at 14 days	24.388	4	<0.001	***
Feeding type at 21 days	17.376	4	<0.01	**
Feeding type at 3 months	7.277	4	0.122	n.s.
Feeding type at 6 months	4.110	4	0.391	n.s.
Feeding method at 7 days	49.989	5	<0.001	***
Feeding method at 14 days	35.926	5	<0.001	***
Feeding method at 21 days	17.572	4	<0.01	**
Feeding method at 3 months	8.497	3	<0.05	*
Feeding method at 6 months	8.385	5	0.136	n.s.

Note: χ^2 – chi-square; p – significance level; df – degree of freedom; n.s. – statistically insignificant difference; * statistically significant difference for significance level α = 0.05; ** statistically significant difference for significance level α = 0.01; *** statistically significant difference for significance level α = 0.001.

Table 6. The connection between early colostrum application no later than 2 hours after birth and feeding type and method

The connection between early colostrum application no later than 2 hours after birth and feeding type and method	Value χ^2	df	p	Stat. sign.
Feeding type in the first week	3.369	3	0.338	n.s.
Feeding type at 14 days	6.791	4	0.147	n.s.
Feeding type at 21 days	9.629	4	<0.05	*
Feeding type at 3 months	2.022	4	0.732	n.s.
Feeding type at 6 months	2.327	4	0.676	n.s.
Feeding method at 7 days	14.933	5	<0.05	*
Feeding method at 14 days	9.519	5	0.090	n.s.
Feeding method at 21 days	10.707	4	<0.05	*
Feeding method at 3 months	7,736	3	0.052	n.s.
Feeding method at 6 months	11,803	5	<0.05	*

*Note: χ^2 – chi-square; p – significance level; df – degree of freedom; n.s. – statistically insignificant difference; * statistically significant difference for significance level α = 0.05.*

The results of the analysis show that timely colostrum application no later than 2 hours after birth has a significant effect on the way the child is fed in several stages of his/her development. At 21 days and 6 months, statistical significance was identified with $p < 0.05$ and $p < 0.05$. At 21 days, mothers having applied colostrum in time more often said their babies were exclusively breastfed. It was statistically significant that these mothers less often combined breastfeeding with alternative supplementary feeding. In the six-month period, the tendency was confirmed. Mothers who applied colostrum early, significantly more often reported their babies were exclusively breastfed. They said that their children were breastfed in combination with alternative supplementary feeding.

These statistics emphasise the importance of early colostrum administration. This fact should be implemented in nursing plans and educational programs for medical staff and parents. During the first 21 days after birth and 6 months of the child's life, early colostrum application can significantly influence nutrition, which can have long-term positive effects on the child's health.

Orofacial stimulation during hospitalisation was monitored using four scale items (once a day, twice a day, three times a day or more, did not take place). The evaluation of statistically significant associations between orofacial stimulation and feeding type and method is shown in Table 7.

Table 7. The connection between orofacial stimulation during hospitalisation and feeding type and method

The connection between orofacial stimulation during hospitalisation and feeding type and method	Value χ^2	df	p	Stat. sign.
Feeding type in the first week	53.712	9	<0.001	***
Feeding type at 14 days	43.675	12	<0.001	***
Feeding type at 21 days	16.843	12	0.156	n.s.
Feeding type at 3 months	18.846	12	0.092	n.s.
Feeding type at 6 months	13.934	12	0.305	n.s.
Feeding method at 7 days	41.039	15	<0.001	***
Feeding method at 14 days	25.008	15	0.050	n.s.
Feeding method at 21 days	17.020	12	0.149	n.s.
Feeding method at 3 months	13.015	9	0.162	n.s.
Feeding method at 6 months	12.210	15	0.663	n.s.

*Note: χ^2 – chi-square; p – significance level; df – degree of freedom; n.s. – statistically insignificant difference; *** statistically significant difference for significance level α = 0.001.*

Statistical analysis showed several significant correlations in the early stages of hospitalisation. In the first week, we found a statistically significant association between orofacial stimulation and nutrition type. Specifically, mothers who reported their children had received orofacial stimulation once a day preferred foreign breast milk and significantly less often combined different feeding types than mothers whose children received orofacial stimulation more than once a day

($p < 0.001$). We found a similar connection on the 14th day of hospitalisation ($p < 0.001$). In this case, mothers who reported a daily frequency of orofacial stimulation reported a combined feeding type more. We found a statistically significant connection regarding the method of nutrition in the first week of the child's life ($p < 0.001$). Mothers who indicated once-a-day orofacial stimulation were significantly more likely to report the use of bottle-only formula as their main feeding method than

mothers whose infants received orofacial stimulation multiple times per day. On the contrary, in other time periods, such as 21 days of hospitalisation and at 3 and 6 months of the child's age, the association between orofacial stimulation and feeding habits was not statistically significant.

Discussion

The key finding of this study is that nationality, education, and the first breastfeeding moment have a significant effect on the feeding type and method at different time periods after birth. The results reveal complex patterns. Based on the statistical analysis, we can conclude that the mother's nationality has a statistically significant effect on the nutrition type on the 14th and 21st days of hospitalisation. However, this effect decreases over time and is no longer statistically significant at three and six months of the child's age. Regarding the mother's education, we observed a statistically significant effect on the nutrition type at 14 days, 21 days, and 6 months of the child's age. Likewise, the type of nutrition in the first 21 days was statistically significantly related to the mother's level of education. Considering the influence of first breastfeeding and skin-to-skin contact, we found that these factors have a strong influence on the feeding type and method, especially in the first week and at 14 days. The statistical significance of the influence of these factors on the nutrition type was also demonstrated in the first 21 days and three months of the child's age.

In a survey covering six European countries, it was found that mothers with higher education are more likely to visit the intensive care unit (ICU) and more often practice skin-to-skin contact (Raiskila et al., 2017). Significantly, skin-to-skin contact supports breastfeeding, infant growth and development, and infant-parent relationships (Moore et al., 2016). According to the results of a systematic review and meta-analysis of Karimi et al. (2019), it can be stated that when newborns are placed in direct skin-to-skin contact with their mothers immediately after birth, they display unique intuitive behaviour. This contact increases verbal and non-verbal communication between the mother and the child, leading to heightened responses to the mother's physical touch. This interaction supports the development and progress of the newborn's behaviour. As a result, the baby will naturally latch onto the mother's breast, master suckling and begin the feeding process. Skin-to-skin contact in the first hour boosts the mother's self-confidence and reduces her anxiety about the lack of milk. When babies have skin-to-skin contact with their mothers, their blood glucose levels are more optimal. According to research by Aghdas et al. (2014); Widström et al. (2019), this effect is further enhanced by the combination of skin-to-skin contact and breastfeeding, which reduces the need for supplementary feeding. Therefore, it is important to increase the health literacy of mothers about the importance of skin-to-skin contact. Regarding orofacial stimulation during hospitalisation, we observed a high statistical significance in relation to the nutrition type and method in the first week and in 14 days, but this effect decreased over time and was no longer significant at three and six months of the child's age. On the other hand, the study of Guala et al. (2017) revealed a significant association between mothers who practice skin-to-skin contact and a higher percentage of exclusive breastfeeding after hospital discharge. This positive effect persisted three and six months after delivery. According to WHO recommendations (2009), skin-to-skin contact between the mother and the newborn

should be preferred after caesarean section. Our data, supported by statistical evidence, show increased rates of exclusive breastfeeding compared to groups where skin-to-skin contact was not established in the operating theatre or where skin-to-skin contact was established with the infant's father. Overall, the results suggest that sociodemographic factors and early mother–child interactions may have a long-term impact on feeding patterns. However, the influence of these factors may change over time, pointing to the need for further long-term research to identify the mechanisms by which these factors affect dietary patterns.

A study by Witzany and Velemínský (2019) on the lifestyle of mothers of children with disorders offers insights into family changes in newborns with specific needs. The results regarding social isolation and place of residence highlight the influence of external factors on nutritional care and confirm the need for a holistic approach including nutritional, social, and community support. Both studies show the importance of targeted interventions from healthcare workers for the positive development and overall health of premature babies and their families. The study by Whitehill et al. (2021) states the same.

Study limitations
Our study has certain limitations that we need to acknowledge. Firstly, the limited sample size diminishes the potential for extrapolating our findings to the broader population. To enhance precision, acquiring a more extensive and representative sample is imperative. Additionally, we should acknowledge the restricted data collection, limited to a single hospital in the Czech Republic. Expanding our research to encompass multiple hospitals across the Czech Republic would yield more pertinent results.

Conclusion

This longitudinal study, focusing on the analysis of various factors, showed how socio-demographic and nursing aspects influence the nutritional management of preterm infants during the first six months of life. The analysis showed that the mother's nationality has a significant influence on the feeding method, especially at 14 and 21 days after birth. During this period, Czech mothers more often preferred breastfeeding with supplemental feeding, while Roma mothers and mothers of other nationalities had different preferences. However, this effect decreased over time and was no longer statistically significant at three and six months of age. Maternal education was another factor that significantly influenced the nutrition type at specific periods after birth. Mothers with secondary and higher education were more likely to combine different types of formula. Mothers with lower education more often preferred formula. The key interventions that positively contributed to breastfeeding were the first placing of the newborn on the mother's breast, skin-to-skin contact, and orofacial stimulation. These interventions emphasise the importance of early interaction and support the mother-infant relationship for successful breastfeeding. This research expands the existing spectrum of knowledge, which can enable healthcare workers, especially paediatric nurses, midwives, nutritional therapists, and other healthcare professionals, to better understand and address the nutritional needs of premature babies. The provided nursing care can be more personalised and effective, which is essential to support the optimal development and health of premature babies.

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