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Maternal physical health and breastfeeding problems in Croatia: national online survey of new mothers

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ABSTRACT

Objective: To document maternal physical health and breastfeeding problems in the first six months after giving birth in Croatia during the pandemic.

Methods: We conducted a cross-sectional study using an online questionnaire between February and April 2022 among resident Croatian women who had enrolled in the RODA ('Parents in Action') online antenatal course. Women aged 18 + years, who had given birth in a Croatian maternity facility between February 2020 and December 2021 were eligible. The questionnaire contained 75 items, covering sociodemographic characteristics, hospital practices, community support, maternal mental and physical health.

Results: Postpartum health and breastfeeding items were completed by 1760 participants. Most women were primiparous (80 %, n = 1420) and 72 % birthed vaginally (n = 1274). Major physical health issues were fatigue (28 %; n = 487), back pain (14 %; n = 252), and haemorrhoids (10 %; n = 171). Urinary incontinence was a minor problem for 23 % (n = 397), somewhat of a problem for 8 % (n = 139) and a major problem for 4 % (n = 67).The most common breastfeeding problems were nipple pain/damage 50 % (n = 885), difficulty attaching 43 %, (n = 761), low milk supply 28 % (n = 490), mastitis 22 % (n = 391), engorgement 22 % (n = 393), breast refusal 22 % (n = 381), and too much milk 22 % (n = 380).

Conclusion: Consistent with reports of maternal postpartum health in other countries, women in Croatia experienced many physical health challenges in the six months after childbirth. Most women described problems with breastfeeding; the frequency of pain associated with breastfeeding is concerning. Healthcare systems need to provide effective assistance to enable new mothers to establish breastfeeding without nipple pain and damage even during times of emergency measures.

Introduction

The postpartum phase of the reproductive cycle is a time of major transition for women physically and emotionally, yet maternal health problems tend to be under-recognised by women, families and their health care providers [1]. Furthermore, postpartum maternal health care receives the lowest priority in maternity care in research and teaching [2]. A continued lack of quality maternal health data "is both a result and contributor to the neglect of maternal health as a priority topic" [3p. 1528]. In the UK, the National Health Service referred to postnatal care as the "Cinderella" service when they updated the NICE guidelines for postnatal care in 2021 [3,4]. During pregnancy, women usually receive structured care from their maternity provider, with regular checks and opportunities to monitor the woman's physical and emotional needs. But after childbirth, women's care transitions to community care, which is often fragmented, unstructured and tends to prioritise infant health over maternal health [1,3,5].

Maternal morbidities are wide ranging and extend beyond the

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minimal six-week postpartum period [5]. Women experience tremendous physiological changes during the perinatal period and they may be unprepared for these changes which can be exacerbated by lack of sleep and stresses of new parenthood [6]. Almost all women experience at least one physical health symptom following childbirth [7]. Physical exhaustion is common, as well as back pain, haemorrhoids and breastfeeding problems, such as mastitis [5,8–10].

The first large study of long-term health problems after childbirth was a postal survey of 11,701 women who had given birth in Birmingham, UK between 1978 and 1985, initially exploring long-term consequences of epidural anaesthesia [11]. The researchers were surprised to find that 45 % of the women reported at least one new health problem starting within three months of birth, and lasting at least six weeks [11]. In the late 1980s and 1990s, maternal health was the focus on studies in Australia and the UK. In Victoria, Australia, the state government funded an inquiry into childbirth [12], and included a statewide survey of new mothers in 1989 [13]. Two further population-based surveys in Victoria followed in 1994 and 2000 [14]. In Scotland, Glazener and colleagues conducted a prospective study of maternal postpartum health of 1249 women who gave birth in Aberdeen in 1990–1991 [8]. In Canada, Ansara and colleagues published a study of women's physical health problems, after giving birth in six Toronto-area hospitals [7]. The first study in the USA appears to be the *Listening to Mothers* national survey in 2002, followed by *Listening to Mothers II*, in 2005 conducted by Childbirth Connection [15]. The first study in Europe we identified is a prospective study of 1186 women who gave birth in 1993–1994 in France and Italy [5]. A 2023 review of maternal health problems after birth identified 23 articles published between 2000 and 2021; the only European countries included were The Netherlands and Italy [10].

Many women experience difficulties with breastfeeding, with about 50 % reporting nipple pain [7,16]. Nipple trauma or damage is reported by 20 to 30 % of breastfeeding women [16,17], and this is an important risk factor for developing mastitis, a painful distressing condition for new mothers [18]. About one third of women report low milk supply, which may be due to a range of medical conditions or result from poor support or lack of confidence [16,17,19].

Postpartum care in Croatia consists of regular home visits by the local community nurse, with the first visit scheduled within 72 h of hospital discharge. Community nurses receive a polyvalent education, hence have limited breastfeeding knowledge, unless additionally trained. At six weeks postpartum, women visit their primary care gynaecologist/obstetrician, who has usually received minimal, if any, education on breastfeeding matters. Breastfeeding support groups are available, albeit their number decreased dramatically during the pandemic. A free breastfeeding hotline, run by the parenting organisation RODA, is available. Of a total of 28 International Board Certified Lactation Consultants, a limited number work privately, some of whom continued to provide virtual consultations during the pandemic. All public health services are provided free of charge.

We were unable to identify any published studies of maternal postpartum physical health in Croatia, so our survey of maternity care practices during the pandemic [20] provided an opportunity to document women's physical health and breastfeeding problems using a large sample from across the country. The aim of this paper is to describe women's postpartum physical health and breastfeeding difficulties, since these problems have significant implications for women's well-being, yet have not been previously reported in Croatia.

Methods

We conducted a cross-sectional study using an online questionnaire between February and April 2022 among resident Croatian women who had enrolled in the RODA ('Parents in Action') online antenatal course [20]. At the time, RODA was the only provider of antenatal education in the Republic of Croatia, given that all face-to-face courses had been suspended, due to the pandemic restrictions. The sample size was calculated according to the number of women who had completed the Roda online antenatal course in the previous two years prior to data collection (n = 13,904) using Sample Size Calculator (Creative Research Systems Inc.) with an alpha of 0.05, an expected drop-out rate of 20 % and a confidence level of 95 %. Based on that calculation, we aimed to approach at least 448 women. Women received invitations to complete the questionnaire during the study period by email, followed by two, monthly reminder emails. Women aged 18+ years, who had given birth in a Croatian maternity facility between February 2020 and December 2021 were eligible. This almost 24-month window for infant date of birth provided a large enough sample to describe maternal health in a group of women in Croatia during the COVID-19 pandemic.

Data measures

The questionnaire contained 75 items, covering sociodemographic characteristics, hospital practices, community support, maternal mental and physical health, overall self-rated health and breastfeeding problems.

In this paper, we focus on maternal physical health and breastfeeding problems occurring in the first six months postpartum. The online survey provided a list of eight common physical health problems, as well as "other", and participants were asked to select one option: no; minor problem; somewhat of a problem; or major problem, to each, as previously used in an Australian cohort study [21]. Physical health problems included fatigue, back pain, pain around the vagina/ Caesarean wound pain, constipation, haemorrhoids, urinary incontinence, bowel incontinence, and other.

A separate question asked: "In the first six months after giving birth did you experience any of the following breastfeeding difficulties (please tick all that apply)?" Seven common breastfeeding problems were listed, similar to the Ringing Up about Breastfeeding (RUBY) study [17]. The listed problems were: nipple pain/damage; difficulty attaching; mastitis; low milk supply; engorgement, breast refusal and too much milk. An "other" option was also given, allowing free-text comments.

Analysis

We planned to present a descriptive analysis, showing the proportion of primiparous and multiparous women reporting these common postpartum problems. In posthoc analyses, we calculated point estimates and Confidence Intervals (CI) for the Odds Ratios (OR) using the cci command in Stata/SE 15.0 to compare the relationship between method of birth and postpartum maternal health problems, and between parity and breastfeeding problems [22].

Ethics approval and data management

Ethics approval was obtained from the Ethics Committee of the University of Split, School of Medicine on 15 December 2021 (No. 2181-198-03-04-2L-0092). All participants were informed of the purpose and content of the survey, and by commencing the survey, gave their voluntary consent to participate. The questionnaire was created in 1 Ka survey online tool (www.1ka.si, version 21.11.16, 2021, Ljubljana, Slovenia). No incentives were offered for completion of the questionnaire. All responses were kept anonymous and stored securely on a code-encrypted university server.

Results

A total of 2130 mothers responded to the questionnaire, from all regions of Croatia. Not all items were completed, so the denominator varies. Table 1 shows the sociodemographic characteristics of the study participants. The mothers' mean age at the time of the birth was 32.6 years. Most women lived in a large city and had completed tertiary education. About 80 % were primiparous, and three-quarters birthed

Table 1
Sociodemographic characteristics of the participants of the online survey.

Characteristics	N	%
Maternal age (years, at birth) (n = 1715)		
<25	47	2.7
25 to < 35	1139	66.4
35 and >	529	30.8
Maternal highest education (n = 1716)		
Primary	6	0.3
Secondary	330	19.2
Tertiary	1380	80.4
Place of residence (n = 1716)		
Zagreb, Rijeka, Split or Osijek	922	53.7
Other city	552	32.2
Rural/remote area	242	14.1
Parity (n = 2130		
Primiparous	1709	80.2
Multiparous	421	19.8
Method of birth (n = 2130)		
Vaginal	1546	72.6
Caesarean section	584	27.4
Smoking status (n = 1716)		
Yes	251	14.7
No	1087	63.7
Former smoker	378	22

vaginally.

Maternal physical health

Maternal physical health problems in the first six months after birth are shown in Table 2. Women indicated the severity of each health problem. Fatigue was almost universal and 28 % reported that fatigue was a major problem for them. Back pain was experienced by 80 % of participants. Over half the participants reported haemorrhoids, although most regarded this as a minor problem. Following vaginal birth, perineal pain was a major problem for 8 % of women, while wound pain was a major problem for 8 % of the women following Caesarean section. Other problems included constipation, urinary and bowel incontinence.

We compared the general physical health problems (including minor, somewhat and major problem) stratified by method of birth (vaginal/Caesarean section) (Table 3). Women who had a vaginal birth were twice as likely to experience urinary incontinence than women who had a Caesarean section (Odds Ratio 2.64 (95 % CI 2.05, 3.43). Women who had a vaginal birth were also more likely to report haemorrhoids, constipation and bowel incontinence than women who had a Caesarean section (Table 3).

Looking at physical health conditions and parity, multiparous women reported higher levels of urinary incontinence and haemorrhoids. Urinary incontinence was reported by 44.4 % (151/340) of multiparous women, compared to 31.8 % (452/1420) of primiparous women; OR 1.71 (95 % CI 1.33, 2.19). Haemorrhoids were reported by 61.8 % (210/340) of multiparous women compared to 55.3 % (786/1420) of primiparous women; OR 1.30 (95 % CI 1.02, 1.68).

Table 2
Physical health problems in the first six months after giving birth (n = 1760).

	Not a problem n *(%)*	**Minor problem n *(%)***	**Somewhat of a problem n *(%)***	**Major problem n *(%)***
Fatigue	40 *(2)*	550 *(31)*	683 *(39)*	487 *(28)*
Back pain	344 *(20)*	680 *(39)*	484 *(28)*	252 *(14)*
Haemorrhoids	764 *(43)*	543 *(31)*	282 *(16)*	171 *(10)*
Constipation	1012 *(58)*	508 *(29)*	173 *(10)*	67 *(4)*
Perineal pain (vaginal birth; n = 1274)	493 *(39)*	490 *(38)*	195 *(15)*	96 (8)
Painful Caesarean wound (Caesarean birth; n = 486)	88 *(18)*	249 *(51)*	111 *(23)*	38 (8)
Urinary incontinence	1157 *(66)*	397 *(23)*	139 *(8)*	67 *(4)*
Bowel incontinence	1520 *(86)*	164 *(9)*	57 *(3)*	19 *(1)*
Other*	1065 *(82)*	37 *(3)*	91 *(7)*	102 *(8)*

*musculoskeletal = 45 (2.6 %), others < 1 % (episiotomy problems, infection [not breast]).

Table 3
Physical health problems in the first six months after giving birth, stratified by method of birth.

	Vaginal birth (N = 1274) n (%)	**Caesarean section (N = 486) n *(%)***	**Odds Ratio (95 % CI)**
Fatigue	1247 (98)	473 (97)	1.27 (0.50, 2.57)
Back pain	1017 (80)	399 (82)	0.86 (0.65, 1.14)
Haemorrhoids	772 (61)	224 (46)	**1.80 (1.45, 2.23)**
Constipation	568 (45)	180 (37)	**1.37 (1.10, 1.71)**
Urinary incontinence	506 (40)	97 (20)	**2.64 (2.05, 3.43)**
Bowel incontinence	190 (15)	50 (10)	**1.53 (1.09, 2.17)**

Breastfeeding difficulties

Participants were able to indicate all the difficulties they had experienced related to breastfeeding in the first six months using a predefined list. Table 4 shows breastfeeding difficulties in total and stratified by parity. Nipple pain/damage was experienced by 50 % of participants and was similar in multiparous women and primiparous women. Mastitis was reported by 22 % of women, regardless of parity. Primiparous women were twice as likely as multiparous women to report difficulty attaching baby to the breast (48 % vs 24 %) and low milk supply (31 % vs 14 %). Multiparous women were more likely than primiparous women to report "too much milk": 26 % vs 21 % (Table 4).

Table 5 shows the list of breastfeeding difficulties stratified by mode of birth. Nipple pain/damage and too much milk were higher in women with vaginal births, while low milk supply and engorgement were higher in women with Caesarean section births.

Table 4
Breastfeeding difficulties in the first six months postpartum stratified by parity (n = 1760).

	Total (N = 1760) n *(%)*	**Primiparas (N = 1420) n (%)**	**Multiparas (N = 340) n *(%)***	**Odds Ratio (95 % CI)**
Nipple pain/ damage	885 *(50)*	725 *(51)*	160 *(47)*	1.17 (0.92, 1.50)
Difficulty attaching baby	761 *(43)*	680 *(48)*	81 *(24)*	**2.94 (2.23, 3.90)**
Low milk supply	490 *(28)*	442 *(31)*	48 *(14)*	**2.75 (1.97, 3.89)**
Engorgement	393 *(22)*	317 *(22)*	76 *(22)*	0.998 (0.75, 1.35)
Mastitis	391 *(22)*	311 *(22)*	80 *(24)*	0.91 (0.68, 1.22)
Breast refusal	381 *(22)*	317 *(22)*	64 *(19)*	1.24 (0.91, 1.70)
Too much breast milk	380 *(22)*	292 *(21)*	88 *(26)*	**0.74 (0.56, 0.99)**

*All other problems < 1 %.
Inverted nipples (n = 15); Let-down problem (n = 11); Nipple/breast thrush (n = 10); Flat nipples; White spot/nipple blister (n = 9); Infant jaundice/very sleepy; Nipple shield (n = 7); Infant difficulty sucking; Infant tongue-tie (n = 4); DMER; Breast abscess; Breast lump; Breast pain; Poor advice/support (n = 3); Infant very unsettled; Medication; Blocked duct; Delayed lactogenesis; Lost milk; Infant allergy (n = 2); Fed from one breast; Infant inadequate weight gain; Nipple vasospasm (n = 1).

Table 5
Breastfeeding difficulties in the first six months postpartum stratified by method of birth (n = 1760).

	Total (N = 1760) n *(%)*	Vaginal birth (N = 1274) n *(%)*	Caesarean section (N = 486) n *(%)*	Odds Ratio (95 % CI)
Nipple pain/ damage	885 *(50)*	669 *(52.5)*	216 *(44.4)*	**1.38 (1.11, 1.71)**
Difficulty attaching baby	761 *(43)*	548 *(43.0)*	213 *(43.8)*	0.97 (0.78, 1.20)
Low milk supply	490 *(28)*	333 *(26.1)*	157 *(32.3)*	**0.74 (0.59, 0.94)**
Engorgement	393 *(22)*	268 *(21.0)*	125 *(25.7)*	**0.77 (0.60, 0.99)**
Mastitis	391 *(22)*	284 *(22.3)*	107 *(22.0)*	1.02 (0.79, 1.32)
Breast refusal	381 *(22)*	271 *(21.3)*	110 *(22.6)*	0.92 (0.71, 1.20)
Too much breast milk	380 *(22)*	291 *(22.8)*	89 *(18.3)*	**1.32 (1.01, 1.74)**

*All other problems < 1 %.

Discussion

Many clinicians and families expect the physical problems following pregnancy and childbirth to resolve in the six weeks or so following birth [5], but as seen in our study this is not the reality for most women. In 1991, Macarthur and colleagues stated that the "full extent of postpartum morbidity is not recognised by the medical profession" [11 p. 1195], and it seems likely the same is true today. In our study, 50 % of women suffered nipple pain and/or damage post-partum, regardless of parity. Practically all participants experienced fatigue during the first six months after giving birth, of which more than a quarter stated that it was a major problem. Four fifths of participants were burdened by back pain and more than half suffered from haemorrhoids.

Using self-report for health concerns is an appropriate methodology. Even recent data from primary care show differences between medical records and women's self-report data: "sensitive health needs, such as incontinence and sex-related concerns, were not identified using clinical records … Women may be more reluctant to report these to a health professional or not view these to be medical concerns" [23].

Tiredness is almost universal for new mothers – 93 % of mothers in the US national study, *New Mothers Speak Out*, described themselves as "tired" in the first two months after birth [15]. Only 2 % of our sample said they had not experienced fatigue in the first six months postpartum.

Back pain was reported by 80 % of our participants and is highly prevalent in all studies of postpartum mothers. In the US national study, *New Mothers Speak Out,* 36 % of mothers reported backache as a new problem in the first two months postpartum, and 24 % experienced ongoing pain at six months [15]. In Scotland, 20 % had backache at 12–18 months [8]; in Italy 51 % and France 65 % reported backache at 12 months, which was higher than the proportion at 5 months [5]. Schytt and colleagues asked Swedish women about "low back pain", and 28 % confirmed that they had experienced it at 2 months and 34 % at 12 months [24]. The authors attributed the increase in low back pain to the demands of childcare [24]. Future studies could collect data separately for low back pain, thoracic pain and neck and shoulder pain to help clarify the problem.

Haemorrhoids are a common physical problem after childbirth, but generally expected to resolve fairly quickly [25]. However, in the study in France and Italy, "piles" were also more prevalent at 12 months than 5 months: 21 % in Italy and 26 % in France [5]. Haemorrhoids were a new problem for 26 % of new mothers in the first two months in the US study, and remained a problem for 9 % at six months [15]. We found higher rates in multiparous women, in contrast to studies in the UK [8,11].

Urinary incontinence was reported by 34 % of participants, and a major problem for 4 % of them. This figure is similar to other studies [10]. We found higher reporting of urinary incontinence in women who birthed vaginally, as expected [26]. Urinary incontinence was more common in multiparous women in our study. This is consistent with a recent USA cohort study which found urgency urinary incontinence and "urinary symptom bother" at 12 months postpartum was associated with increasing parity [27].

Our participants indicated a large number of breastfeeding problems. About half reported nipple pain or damage, which is similar to 52 % in Canada [7], but not as high as 70 % reported in the US *Life After Pregnancy* study 2–6 months after birth [9]. A recent Australian study of 1,016 primiparous mothers reported 39 % experienced nipple pain/ damage [17]. Mastitis was reported by 22 % of our sample, which is within the range reported in other studies [18]. There was a noticeable difference in the prevalence of engorgement: 22 % in both primiparous and multiparous women in our Croatian sample, compared to just 2 % in the Australian study [17]. This may indicate routine separation of mother and infant or other practices in Croatia, particularly following Caesarean birth. Unrestricted access to newborn infants admitted to the Neonatal Unit is uncommon in Croatia, hence women are often separated from their sick and small newborns, and infrequently able to breastfeed [28]. This typically leads to engorgement. The high prevalence of engorgement among Croatian women may also reflect the lack of understanding of the natural process of milk production, resulting in misinterpretation of increased milk volume on day two postpartum ('lactogenesis II') as 'engorgement'. Poor awareness of lactational physiology among new Croatian mothers was evident in a recent study exploring reasons for maternal request for formula supplementation in hospital [19], suggesting the need for better antenatal preparation of women.

Clinical implications

Maternal physical health problems can interfere with activities of daily living and caring for children. Even at 6 months postpartum, 18 % of mothers in the US who had a Caesarean reported pain at the site of the incision [15]. Problems like urinary and faecal incontinence, while not common, may be "socially devasting" [5 p. 1208]. Many women are embarrassed to discuss urinary incontinence with their health providers because of the stigma associated with this problem; leaking urine may be perceived as unclean and uncontrolled [29]. Both mothers and clinicians may have poor understanding of pelvic floor exercises. Discussion about urinary symptoms needs to be normalised.

Clinicians often prioritise the infant when providing postpartum care and education, and so it is important to acknowledge the extent of health issues faced by mothers as well [1,30]. There is evidence that women want more information about their physical recovery post-birth, as well as self-care and safe postpartum exercise [31]. Studies of postpartum women in the US indicate that "Women felt overwhelmed by the difficulty of breastfeeding and unprepared to manage the problems they encountered, including issues with latch, pain, milk supply, pumping, and return to work. Many women did not breastfeed as long as they intended" [31 p. 17]. The high levels of women reporting difficulties attaching the baby to the breast and nipple pain in our study are concerning and require attention. Since maternal physical and breastfeeding problems are associated with poorer emotional wellbeing [32], maternity services and clinicians should prevent these problems where possible, by sensitively enquiring about physical health and providing assistance in a timely manner.

Strengths and limitations

To our knowledge, this is the first study to report Croatian women's physical health in the postpartum period.

The study was not population-based, but provides data from a large

sample of women from across Croatia. Since we recruited through an educational service, the majority of our sample were primiparous and had a higher level of education. Since the data were collected retrospectively and we asked participants about the first six months postpartum, they may have under-reported difficulties experienced early postpartum compared to studies collecting data closer to the experience. It is possible that healthcare restrictions due to the pandemic increased maternal physical health and breastfeeding problems in this study, but we cannot determine this.

Conclusion

Consistent with reports of maternal postpartum health in other countries, women in Croatia experienced many physical health challenges in the six months after childbirth, with high levels of fatigue and back pain. Most women described problems with breastfeeding; the frequency of pain associated with breastfeeding is concerning. Women need better information, counselling and support with breastfeeding; in particular, more effective assistance to latch the baby to the breast so they can establish breastfeeding without nipple pain and damage. Since maternal physical and breastfeeding problems are associated with poorer emotional wellbeing [32], maternity services and clinicians should prevent these problems where possible, by providing proactive education and sensitively enquiring about physical health and providing assistance in a timely manner.

CRediT authorship contribution statement

Lisa H Amir: Writing – original draft, Methodology, Formal analysis, Conceptualization. **Daniela Drandić:** Writing – review & editing, Project administration, Methodology, Conceptualization. **Anita Pavičić Bošnjak:** Writing – review & editing, Methodology, Conceptualization. **Ana Vidović Roguljić:** Writing – review & editing, Project administration, Methodology, Formal analysis, Conceptualization. **Gill Thomson:** Writing – review & editing, Methodology, Conceptualization. **Irena Zakarija-Grković:** Writing – review & editing, Project administration, Methodology, Data curation, Conceptualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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