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Quality of maternal and newborn care around the time of childbirth for migrant versus nonmigrant women during the COVID-19 pandemic: Results of the IMAgiNE EURO study in 11 countries of the WHO European region

Raquel Costa[1,2,3] | Carina Rodrigues[1,2] | Heloísa Dias[4] | Benedetta Covi[5] | Ilaria Mariani[5] | Emanuelle Pessa Valente[5] | Mehreen Zaigham[6] | Eline Skirnisdottir Vik[7] | Susanne Grylka-Baeschlin[8] | Maryse Arendt[9] | Teresa Santos[10,11] | Lisa Wandschneider[12] | Zalka Drglin[13] | Daniela Drandić[14] | Jelena Radetic[15] | Virginie Rozée[16] | Helen Elden[17,18] | Antonia N. Mueller[8] | Catarina Barata[19] | Céline Miani[12,16] | Anja Bohinec[13] | Jovana Ruzicic[15] | Elise de La Rochebrochard[16] | Karolina Linden[17] | Sara Geremia[5] | Claire de Labrusse[20] | Stephanie Batram-Zantvoort[12] | Barbara Mihevc Ponikvar[13] | Emma Sacks[21] | Marzia Lazzerini[5] | on behalf of the IMAgiNE EURO study group

[1]EPIUnit - Instituto de Saúde Pública, Universidade do Porto, Porto, Portugal

[2]Laboratório para a Investigação Integrativa e Translacional em Saúde Populacional (ITR), Porto, Portugal

[3]Lusófona University/HEI-Lab: Digital Human-environment Interaction Labs, Lisbon, Portugal

[4]Regional Health Administration of the Algarve, Lisbon, Portugal

[5]WHO Collaborating Centre for Maternal and Child Health, Institute for Maternal and Child Health IRCCS "Burlo Garofolo", Trieste, Italy

[6]Department of Obstetrics and Gynecology, Institution of Clinical Sciences Lund, Lund University, Lund and Skåne University Hospital, Malmö, Sweden

[7]Department of Health and Caring Sciences, Western Norway University of Applied Sciences, Bergen, Norway

[8]Research Institute of Midwifery, School of Health Sciences, ZHAW Zurich University of Applied Sciences, Winterthur, Switzerland

[9]Beruffsverband vun de Laktatiounsberoderinnen zu Lëtzebuerg

Abstract

Objective: To describe the perception of quality of maternal and newborn care (QMNC) around the time of childbirth among migrant and nonmigrant women in Europe.

Methods: Women who gave birth at a health facility in 11 countries of the WHO European Region from March 2020 to July 2021 were invited to answer an online questionnaire including demographics and childbirth experience. Data were analyzed and compared for 1781 migrant and 20 653 nonmigrant women.

Results: Migrant women who experienced labor perceived slightly more difficulties in attending routine antenatal visits (41.2% vs 39.4%; $P = 0.001$), more barriers in accessing facilities (32.9% vs 29.9%; $P = 0.001$), lack of timely care (14.7% vs 13.0%; $P = 0.025$), inadequate room comfort and equipment (9.2% vs 8.5%; $P = 0.004$), inadequate number of women per room (9.4% vs 8.6%; $P = 0.039$), being prevented from staying with their baby as they wished (7.8% vs 6.9%; $P = 0.011$), or suffering abuse (14.5% vs 12.7%; $P = 0.022$) compared with nonmigrant women. For women who had a prelabor cesarean, migrant women were more likely not to receive pain relief after birth (16.8% vs.13.5%; $P = 0.039$) and less likely to provide informal payment (1.8% vs 4.4%; $P = 0.005$) compared with nonmigrant women. Overall, the QMNC index was not significantly different for migrant compared with nonmigrant women.

asbl (Professional Association of Lactation Consultants in Luxembourg), Luxembourg, Luxembourg

[10]Universidade Europeia, Lisbon, Portugal

[11]Plataforma CatólicaMed/Centro de Investigação Interdisciplinar em Saúde (CIIS) da Universidade Católica Portuguesa, Lisbon, Portugal

[12]Department of Epidemiology and International Public Health, School of Public Health, Bielefeld University, Bielefeld, Germany

[13]National Institute of Public Health, Ljubljana, Slovenia

[14]Roda – Parents in Action, Zagreb, Croatia

[15]Centar za mame, Belgrade, Serbia

[16]Sexual and Reproductive Health and Rights Research Unit, Institut National d'Études Démographiques (INED), Paris, France

[17]Institute of Health and Care Sciences, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden

[18]Department of Obstetrics and Gynecology, Region Västra Götaland, Sahlgrenska University Hospital, Gothenburg, Sweden

[19]Instituto de Ciências Sociais, Universidade de Lisboa, Lisbon, Portugal

[20]School of Health Sciences (HESAV), HES-SO University of Applied Sciences and Arts Western Switzerland, Lausanne, Switzerland

[21]Department of International Health, Johns Hopkins University, Baltimore, Maryland, USA

Correspondence
Raquel Costa. Instituto de Saúde Pública da Universidade do Porto (ISPUP), Rua das Taipas 135, 4050-600 Porto, Portugal.
Email: raquel.costa@ispup.up.pt

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Conclusion: Gaps in overall QMNC were reported by both migrant and nonmigrant women, with improvements to healthcare necessary for all.

KEYWORDS
childbirth, COVID-19, IMAgiNE EURO study, maternal health care, migrant women, migrant-friendly health systems, neonatal health care, pregnancy

1 | INTRODUCTION

Over the last two decades, the number of international migrants has increased by more than 100 million worldwide.[1] About 90.7 million international migrants live in the World Health Organization (WHO) European Region, accounting for almost 10% of the population in the region and 35% of the global international migrant population.[2] Additionally, the International Organization for Migration (IOM)[3] has alerted that a crisis in migration is expected in the WHO European Region; by March 19, 2022, 3.39 million Ukrainians, mostly women and children, have already crossed borders to neighboring countries and a total 4 million are estimated to migrate from Ukraine to escape the war.[4]

Overall, the health of migrants has been reported to be significantly poorer compared with that of nonmigrants, with variations depending on country, residence status, or length of stay.[5,6] Pregnant women and newborns are particularly vulnerable groups of migrants[7] and complications during pregnancy and birth are among the most frequent health problems for migrant women.[8] Although there is variation (depending on the host country and country of origin), compared with nonmigrant women, migrant women tend to experience higher rates of health problems during pregnancy and childbirth,[2,9–11] higher risk for postpartum depression and relatively poor neonatal outcomes,[9,12–14] and higher maternal and infant mortality.[15–19]

In addition, important inequities in access to care among migrants,[20] in particular to maternal and child healthcare services,[21,22] have been

documented in Europe. Lower utilization of antenatal health care may be a consequence of barriers migrants face in accessing care,[22] including lack of social support, lack of health literacy, language barriers, lack of information, poor experience of care, and discrimination.[21,23] Furthermore, within the process of provision of healthcare services to migrant women, multiple factors associated with poor healthcare experiences have been previously documented, including difficulties related to communication, unfamiliarity with the healthcare system, lack of kind and respectful care,[24–27] lack of language support, cultural insensitivity, poor interactions with healthcare providers, lack of knowledge of legal entitlements and guidelines on the provision of welfare support and maternity care,[5,28] and outright discrimination.[27–30]

The COVID-19 pandemic has, in addition to the increased burden on health systems, reshaped migration flows, the composition of migrant populations in Europe, and the economic panorama, with important consequences for migrants who are overrepresented in low-skilled professions.[31] Although there is a lack of studies on the effect of the COVID-19 pandemic on migrant health, literature suggests that women of racial and ethnic minority groups experienced less social support during pregnancy, childbirth, and the postpartum period.[32]

The WHO has highlighted the urgency of integrating health data from migrant populations in the monitoring framework of the COVID-19 pandemic to assist in the development of adequate response plans and healthcare preparedness.[33] However, even in the European Region, there is an overall lack of routine standardized monitoring systems for assessing and comparing the quality of care in general and disaggregated data for migrant women across countries and regions. How health systems provided maternal care services for migrant women during the COVID-19 pandemic and how migrant women perceived the quality of this care have not been documented.

Assessing the quality of maternal and newborn care (QMNC) among migrant women is important to understand the factors that can potentially affect their health and that of their infants and to promote policies that respond to their specific needs. This information can be used to develop programs with the objective of achieving respectful, migrant-friendly, economically sustainable, and equitable health systems.[34] Migrant-friendly health systems consciously and systematically incorporate the needs of migrants into health financing, policy, planning, implementation and evaluation, including such considerations as the epidemiological profiles of migrant populations, relevant cultural, language, and socioeconomic factors and the impact of the migration process on the health of migrants.[35] Maternal and newborn health outcomes could be improved by increasing the quality of care[36] and reducing healthcare delays among migrant populations.[37]

Using data from the IMAgiNE EURO study, a multicountry effort to document QMNC during the COVID-19 pandemic using standardized data collection instruments, including a set of 40 WHO standards-based quality measures[38] and demographic questions, we aimed to describe the maternal perception of QMNC around the time of childbirth among migrant versus nonmigrant women during the COVID-19 pandemic, in 11 countries of the WHO European Region. Additionally, we aimed to understand how the QMNC index varied by migrant status, when adjusted for country and for sociodemographic characteristics.

2 | MATERIALS AND METHODS

2.1 | Study design and participants

This cross-sectional study used the Strengthening the Reporting of Observational Studies (STROBE)[39] in Epidemiology guidelines. The STROBE Checklist is included as supporting information Table 1. The study protocol was registered in ClinicalTrials.gov (NCT04847336).

Details of the IMAgiNE EURO study methods have been reported elsewhere.[40] Briefly, the study was conducted using an anonymous online survey, between September 2, 2020, and October 28, 2021. Women aged 18 years and older who gave birth in the WHO European Region during the study period (March 1 to October 28, 2021) were eligible. Exclusion criteria were home births. The survey was available in 23 languages and disseminated by study partners in 16 countries of the WHO European Region (Bosnia and Herzegovina, Croatia, Italy, Israel, France, Germany, Latvia, Luxembourg, Norway, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, and Switzerland).

As described elsewhere,[40] suspected duplicates and cases missing 20% or more answers on 45 key variables, including the 40 key quality measures and five key sociodemographic variables (date of birth, age, education, parity, and migrant status) were excluded. There is no universal consensus on the definition of migrant. According to the IOM, migrant is "an umbrella term, not defined under international law, reflecting the common lay understanding of a person who moves away from his or her place of usual residence, whether within a country or across an international border, temporarily or permanently, and for a variety of reasons".[35] The present study defined a migrant as a woman who gave birth in a different country than the one in which she was born.

From the 27 712 participants in the IMAgiNE EURO study, women with missing information on migrant status were excluded. Furthermore, power analysis was performed overall and for each country. Only countries with sufficient power (≥80%) to assess at least a 10% difference in the quality measures between migrant and nonmigrant groups were included in the analysis, given an expected frequency of each quality measure of 10% in the nonmigrant group, a two-tailed z test, and a significance level of 0.05. Based on these predefined criteria, 22 434 participants, from 11 countries, were included in the analysis (Figure 1) of which 16 472 participants contributing to the QMNC index (i.e. participants without missing data in any of the questions that contribute to the QMNC index calculation as reported previously).[40] This sample had a 99% power to detect a 5% difference in the QMNC index between the migrant and nonmigrant group, given a QMNC index of 340 in the nonmigrant group, a two-tailed z test, and a significance level of 0.05.

2.2 | Data collection

Data were collected using a structured questionnaire, based on the WHO standards for improving maternal and newborn care in health

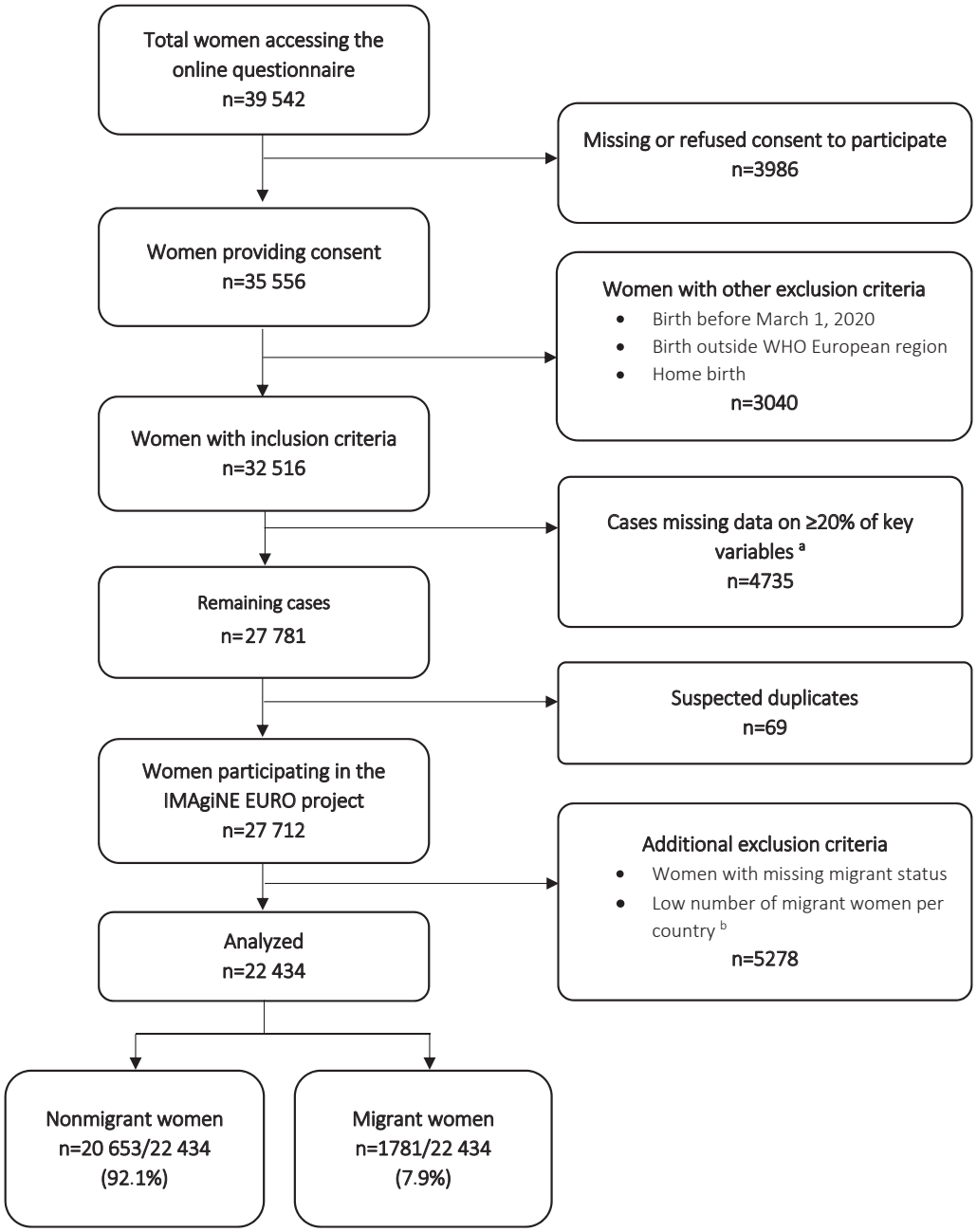

FIGURE 1 Flowchart of participants. [a]Percentage of missing data for each woman was calculated over mandatory questions ($n = 45$). [b]Number of migrant women not sufficient to guarantee a sufficient power (≥ 80%) to assess a 10% difference in the quality measures between migrant and nonmigrant groups, given an expected frequency of each quality measure of 10% in the nonmigrant group, a two-tailed z test, and a significance level of 0.05.

facilities.[38] The survey was disseminated on social media, on institutional websites, or via local networks, according to the local settings and resources.[40] Data were entered using REDCap 8.5.21 (Vanderbilt University, Nashville, TN, USA), via a centralized platform. The process of questionnaire development, validation, and previous use as well as the process of translation and back-translation of the questionnaire is described elsewhere.[41,42,43]

The questionnaire assessed QMNC in health facilities and included 40 questions on one key indicator each. The 40 key indicators were equally distributed in four domains: (1) provision of care; (2) experience of care; (3) availability of human resources and essential physical resources; and (4) reorganization due to the COVID-19 pandemic. These 40 indicators contributed to a total quality index, calculated according to predefined criteria,[38] with higher scores indicating higher adherence to WHO standards. The questionnaire had two versions, one for women who experienced labor and one for those who had a prelabor cesarean, differing only by a few questions, as appropriate (e.g. women who did not experience labor were not asked about pain relief during labor). A definition of labor according to guidelines of the National Institute of Health and Care

Excellence was provided in the questionnaire: "the phase of labor in which you felt strong, regular and painful contractions and the dilatation was around 4 cm or greater".[44] Additionally, indicators were tailored to take into account different modes of birth (spontaneous vaginal, instrumental vaginal, and elective or emergency cesarean), with each woman reporting on 40 WHO quality measures.

Questions on 24 sociodemographic indicators related to individual characteristics of the participants, including age, education (elementary school, junior high school, high school, university degree, postgraduate degree/master/doctorate or higher), parity (nulliparous, multiparous), multiple birth (yes, no), country of birth, and country where the women gave birth, were collected.

2.3 | Ethical aspects

The study was approved by the Institutional Review Board of the coordinating center: the IRCCS "Burlo Garofolo" Trieste, Italy (IRB-BURLO 05/2020 15.07.2020). The study protocol was also reviewed and approved by the ethical committees of four other countries to comply with local regulations: Portugal (Instituto de Saúde Pública da Universidade do Porto, CE20159); Norway (Norwegian Regional Committee for Medical Research Ethics, 2020/213047), Germany (Bielefeld University Ethics Committee, 2020–176); and Latvia (Rīgas Stradiņa universitātes, 22–2/140/2021–16/03/2021). A formal approval was waived by the ethical committee of the other countries, since the questionnaire was online, voluntary, and anonymous (i.e. no personal data were collected). The study was conducted according to General Data Protection Regulation (GDPR) regulations. Women were informed prior to the survey on the objectives and methods of the study, including their rights in declining participation, and each provided informed consent before responding to the questionnaires. Anonymity in data collection during the survey phase was ensured by not collecting any information that could disclose participants' identity. Data transmission and storage were secured by encryption.

2.4 | Data analysis

We performed descriptive analyses, calculating absolute frequencies and percentages for sociodemographic variables and for each of the 40 key quality measures for nonmigrant and migrant women by country and separately for women who experienced labor or who had a prelabor cesarean. Differences between nonmigrant and migrant groups for each quality measure were tested with a χ^2 test. Since there were differences in the proportion of migrants by country, and country is a confounder in the association between quality measures and migrant status, we also performed a logistic regression adjusting for country.

We calculated medians and interquartile ranges (IQRs) for the QMNC index in each dimension of care (provision of care, experience of care, availability of human resources and essential resources, reorganizational changes due to COVID-19) for nonmigrant versus migrant women, by country. Nonparametric Mann–Whitney test was conducted to compare differences between two independent samples (nonmigrant vs migrant women) in each dimension of care and the QMNC index overall and for each country.

Quantile regression analyses were conducted due to the non-normal distribution of the QMNC index,[45] adjusted for country, on the whole sample, with QMNC index as the dependent variable and migrant status (nonmigrant vs migrant women) as the independent variable, including sociodemographic and perinatal characteristics (i.e. maternal age, maternal education, type of hospital, country, type of birth, presence of an obstetrics and gynecology doctor in the team who assisted birth), to account for potential confounding of crude associations by other variables. The same model was performed for each subdomain of the QMNC index.

Additionally, quantile regressions were also conducted by country for each QMNC subdomain and total index as dependent variables, and migrant status as the independent variable adjusted for the sociodemographic and perinatal potential confounders listed above.

Two-tailed $P < 0.05$ was considered statistically significant. Statistical analyses were performed using Stata/SE version 14.0 (Stata Corporation, College Station, TX, USA) and R.[46]

3 | RESULTS

Characteristics of the participants are given in Table 1. Most participants were aged between 25 and 35 years, had a university degree or higher, were nulliparous, and had a vaginal delivery. Migrants were more likely to be older (≥36 years, 24.9% [$n = 444$] vs 19.3% [$n = 3985$]; $P < 0.001$) and to have a postgraduate degree or higher (36.6% [$n = 651$] vs 25.7% [$n = 5314$]; $P < 0.001$) compared with nonmigrant women. When adjusting for country, migrants were more likely to be assisted during birth by a nurse (41.0% [$n = 730$] vs 38.8% [$n = 8004$]; $P = 0.004$) or an obstetrics/gynecology doctor (55.8% [$n = 993$] vs 53.2% [$n = 10980$]; $P = 0.012$) or an obstetrics registrar/medical resident (under postgraduate training) (20.4% [$n = 363$] vs 18.4% [$n = 3796$]; $P = 0.023$), and were less likely to be assisted by a midwife (88.4% [$n = 1574$] vs 89.3% [$n = 18433$]; $P = 0.025$).

Migrant women who experienced labor perceived slightly more difficulties in attending routine antenatal visits (41.2% [$n = 621$] vs 39.4% [$n = 7063$]; $P = 0.001$), barriers in accessing the facility (32.9% [$n = 496$] vs 29.9% [$n = 5358$]; $P = 0.001$), not receiving timely care at facility arrival (14.7% [$n = 221$] vs 13.0% [$n = 2331$]; $P = 0.025$), inadequate room comfort and equipment (9.2% [$n = 138$] vs 8.5% [$n = 1524$]; $P = 0.004$), inadequate number of women per rooms (9.4% [$n = 142$] vs 8.6% [$n = 1537$]; $P = 0.039$), not being allowed to stay with their baby as they wished (7.8% [$n = 117$] vs 6.9% [$n = 1235$]; $P = 0.011$), less likely to report no early breastfeeding (10.1% [$n = 152$] vs 13.7% [$n = 2460$]; $P = 0.002$), and more likely to suffer physical/verbal/emotional abuse (14.5% [$n = 218$] vs 12.7% [$n = 2280$]; $P = 0.022$) than nonmigrant women who experienced labor. Migrant women who

TABLE 1 Social and demographic characteristics of participants, type of health care, and perinatal outcomes by migration status (nonmigrant versus migrant women)

	Participants			
	Nonmigrant (n = 20 653) No. (%)	Migrant (n = 1781) No. (%)	*P* value	*P* value[a]
Country				
Sweden	4418 (21.4)	339 (19.0)	0.020	–
Italy	4462 (21.6)	222 (12.5)	<0.001	–
Norway	3032 (14.7)	233 (13.1)	0.066	–
Slovenia	2179 (10.6)	104 (5.8)	<0.001	–
Portugal	1668 (8.1)	136 (7.6)	0.512	–
France	1272 (6.2)	80 (4.5)	<0.001	–
Germany	986 (4.8)	119 (6.7)	<0.001	–
Croatia	975 (4.7)	97 (5.4)	0.168	–
Serbia	913 (4.4)	83 (4.7)	0.638	–
Switzerland	427 (2.1)	190 (10.7)	<0.001	–
Luxembourg	321 (1.6)	178 (10.0)	<0.001	–
Maternal age, year				
≤24	1017 (4.9)	62 (3.5)	0.006	0.063
25–35	15 648 (75.8)	1275 (71.6)	<0.001	<0.001
≥36	3985 (19.3)	444 (24.9)	<0.001	<0.001
Missing	3 (0.0)	0 (0.0)	>0.999	>0.999
Maternal education				
None	7 (0.0)	1 (0.1)	0.484	0.589
Elementary school	53 (0.3)	6 (0.3)	0.526	0.762
Junior high school	1191 (5.8)	80 (4.5)	0.026	0.126
High school	5312 (25.7)	371 (20.8)	<0.001	<0.001
University degree	8772 (42.5)	672 (37.7)	<0.001	0.002
Postgraduate degree/Master/ Doctorate or higher	5314 (25.7)	651 (36.6)	<0.001	<0.001
Missing	4 (0.0)	0 (0.0)	>0.999	>0.999
Parity at childbirth				
Nulliparous	12 322 (59.7)	1071 (60.1)	0.696	0.056
Multiparous	8328 (40.3)	708 (39.8)	0.638	0.047
Missing	3 (0.0)	2 (0.1)	0.054	–
Multiple birth				
Yes	262 (1.3)	27 (1.5)	0.374	0.515
Type of birth				
Vaginal	14 068 (68.1)	1168 (65.6)	0.028	0.458
Instrumental vaginal	1909 (9.2)	185 (10.4)	0.111	0.554
Cesarean	4676 (22.6)	428 (24.0)	0.179	0.689
Newborn admitted to NICU				
Yes	1719 (8.3)	132 (7.4)	0.180	0.376
Mother admitted to ICU				
Yes	328 (1.6)	25 (1.4)	0.548	0.546
Type of hospital				
Public	19 068 (92.3)	1617 (90.8)	0.021	0.438
Private	1581 (7.7)	164 (9.2)	0.019	0.450
Missing	4 (0.0)	0 (0.0)	>0.999	>0.999

TABLE 1 (Continued)

	Participants			
	Nonmigrant (n = 20653) No. (%)	Migrant (n = 1781) No. (%)	P value	P value[a]
Type of healthcare provider who directly assisted childbirth				
Midwife	18433 (89.3)	1574 (88.4)	0.255	0.025
Nurse	8004 (38.8)	730 (41.0)	0.064	0.004
Student (before graduation)	3463 (16.8)	324 (18.2)	0.124	0.424
Obstetrics registrar/medical resident (under postgraduate training)	3796 (18.4)	363 (20.4)	0.037	0.023
Obstetrics/gynecology doctor	10980 (53.2)	993 (55.8)	0.035	0.012
I do not know (healthcare providers did not introduce themselves)	1960 (9.5)	144 (8.1)	0.051	0.244
Other	3022 (14.6)	202 (11.3)	<0.001	0.001

Abbreviations: ICU, Intensive Care Unit; NICU, Neonatal Intensive Care Unit.

[a]P value adjusted for country.

had a prelabor cesarean were more likely not to receive pain relief after cesarean (16.8% [n = 46] vs 13.5% [n = 371]; P = 0.039) and less likely to provide informal payment (1.8% [n = 5] vs 4.4% [n = 122]; P = 0.005) compared with nonmigrant women who had a prelabor cesarean (supporting information Tables 2–5).

Migrant women reported similar overall QMNC indexes to nonmigrant women (Figure 2). The adjusted models confirmed that the QMNC index did not differ by migration status in any of the four key domains (Table 2). When results were disaggregated by country, migrant women who gave birth in Portugal reported significantly lower overall QMNC index (P = 0.039), whereas those who gave birth in Luxembourg (P = 0.002) reported significantly higher QMNC median index compared with nonmigrant women who gave birth in the same country. In the remaining countries, there were no differences between migrant women's and nonmigrant women's perspectives on overall QMNC (Figure 2A; supporting information Table 6).

For the specific subdomains of the QMNC, migrant women who gave birth in Slovenia (P = 0.025) or Sweden (P = 0.004) reported significantly lower medians on the provision of care index compared with nonmigrant women who gave birth in the same countries (Figure 2B; supporting information Table 6). Migrant women who gave birth in Croatia (P = 0.025) and Portugal (P = 0.024) reported a significantly lower median on the availability of human resources and essential physical resources index compared with nonmigrant women who gave birth in the same countries (Figure 2D; supporting information Table 6). Migrant women who gave birth in Luxembourg reported a significantly higher median on the availability of human resources and essential physical resources index (P = 0.021), and on reorganizational changes due to the COVID-19 pandemic index (P = 0.003) compared with nonmigrant women (Figure 2D, Figure 2E; supporting information Table 6). There was no association between migration status and QMNC when statistical analyses were conducted per country, adjusting for sociodemographic and perinatal characteristics (supporting information Figure 1 and supporting information Tables 7–16).

4 | DISCUSSION

To the best of our knowledge, this is the first multicountry study comparing a large sample of migrant and nonmigrant women's perceptions of the QMNC around childbirth at facility level in 11 countries of the WHO European Region during the COVID-19 pandemic, using a comprehensive set of WHO standards-based quality measures. Results of the study show that, overall, migrant women are more likely to report poor QMNC on specific quality measures; for example, more likely to be separated from their newborn, more likely to suffer from physical, verbal, or emotional abuse, less likely to have timely care at facility arrival, and to experience more barriers to access health facilities. However, when all the indicators are taken into consideration, and adjusted for potential confounders, gaps on the overall QMNC were reported by both nonmigrant and migrant women, without significant differences between them. Similar findings were observed when data were analyzed by country.

Previous literature has reported lower QMNC for migrant women. A recent systematic review on migrant women's experiences of pregnancy, childbirth, and maternity care in European countries found, with high confidence of evidence, that migrant women have difficulties and face barriers in accessing maternity care.[26] Our study shows a substantial proportion of migrant and nonmigrant women had difficulties in attending routine antenatal visits (41.2% vs 39.4%, respectively), and had barriers in accessing the facility (32.9% vs 29.9%, respectively). Previous qualitative studies have emphasized that migrant women feel ignored or rejected

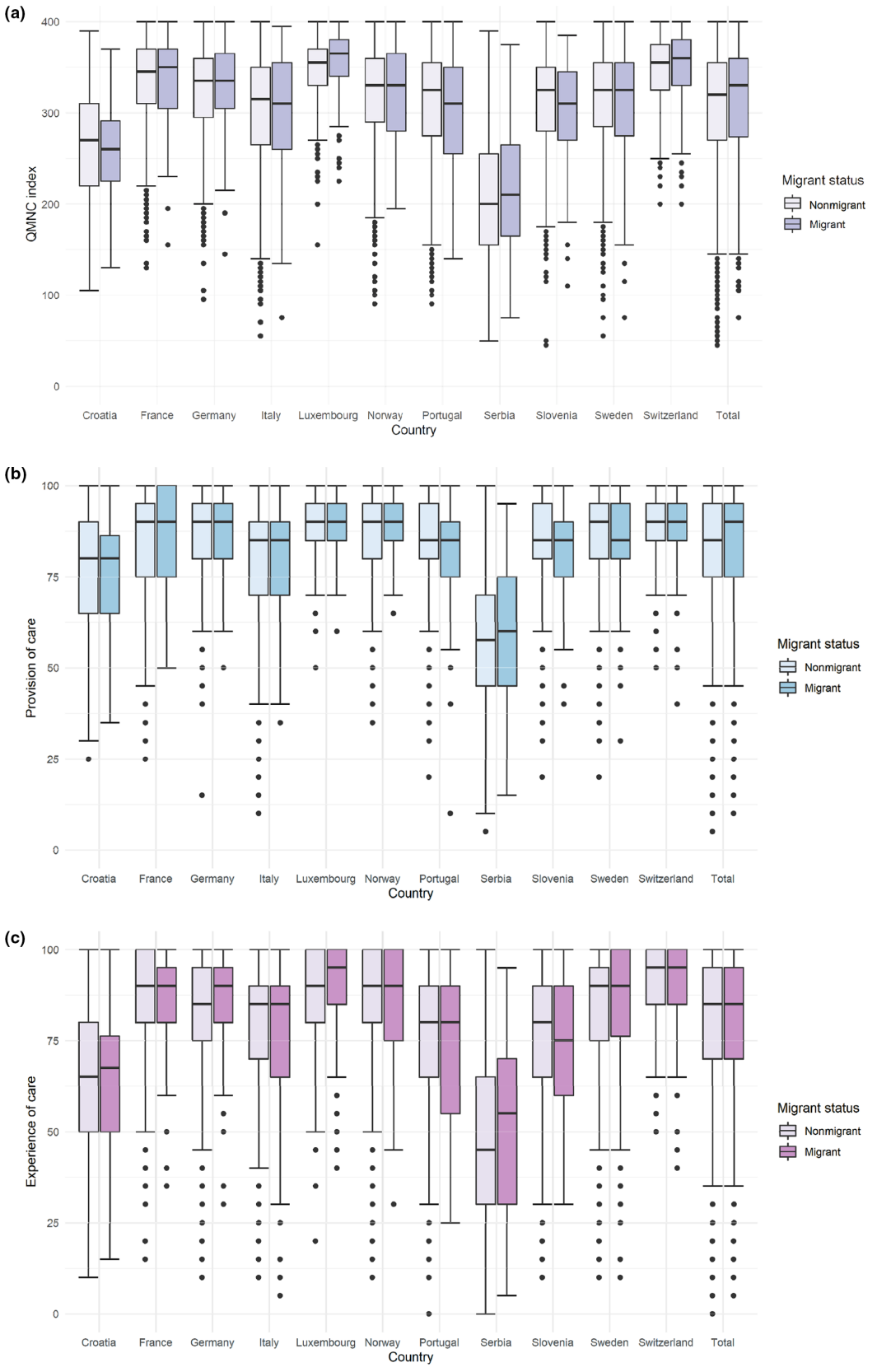

FIGURE 2 (a) Median, interquartile range, and ranges for the QMNC index total by country and migrant status ($n = 16472$). (b) Median, interquartile range, and ranges of the QMNC index on provision of care by country and migrant status ($n = 16472$). (c) Median, interquartile range, and ranges of the QMNC index on experience of care by country and migrant status ($n = 16472$). (d) Median, interquartile range, and ranges of the QMNC index on the availability of motivated human resources and essential physical resources by country and migrant status ($n = 16472$). (E) Median, interquartile ranges, and ranges of the QMNC index on reorganizational changes due to COVID-19 pandemic by country and migrant status ($n = 16472$)

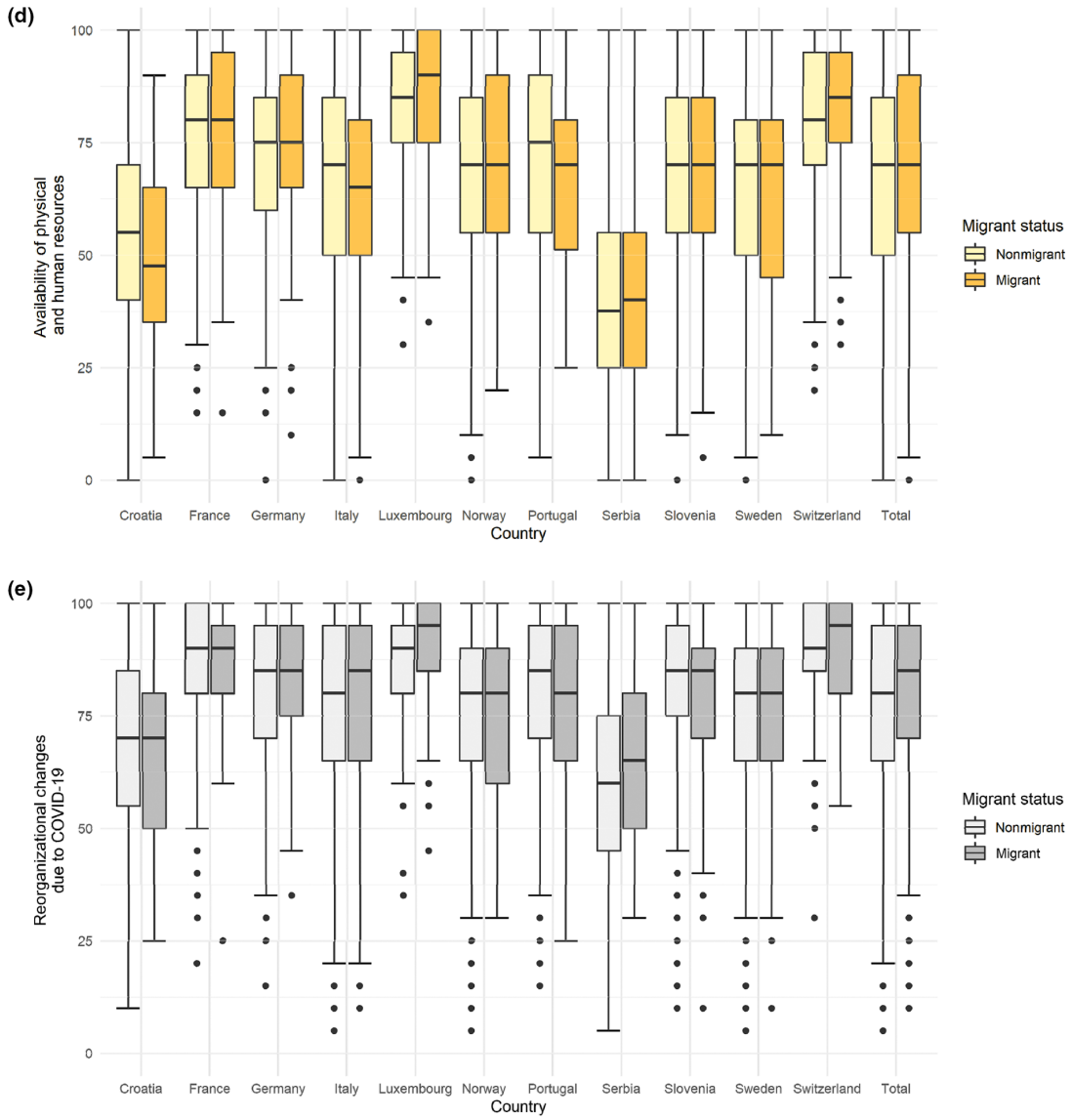

FIGURE 2 (Continued)

in healthcare encounters[47] and report serious neglect of perceived care needs.[48] In a systematic review that included 10 studies and 198 migrant women, Leppälä et al.[29] reported that late provision of health information and diminishment or nonrecognition of care needs by healthcare professionals is an important theme among migrant women seeking maternity care in European Nordic countries. This is still a major issue in healthcare provision,[27–30] which is concerning in itself, but also because suboptimal care may lead to negative health outcomes.

Almost 15% of migrant (and 12.7% of nonmigrant) women reported suffering from physical, verbal, or emotional abuse in health facilities, even in high-income countries.[49,50] Experiences of care-related discrimination,[29] such as prejudice and stereotyping[26]; negative attitudes and behaviors[29,51,52]; lack of respect, indifference and distant and absent behavior[53] have been reported in previous studies related to migrant women's health care and undocumented migrant pregnant women.[54] In our study, forms of physical abuse included, but were not restricted to, being touched improperly and/or without asking permission and being pushed, beaten, slapped, pinched, physically restrained, or gagged. Verbal abuse included, but was not restricted to, being shouted at, insulted, or spoken to rudely. Emotional abuse included, but was not restricted to, being neglected, mocked, or forgotten by healthcare providers. Disrespectful and hostile attitudes from healthcare providers may lead to avoidance of healthcare services,[55,56] which may jeopardize women's and newborns' health outcomes. Our results show that not only migrant women, but also nonmigrant women have experienced this type of mistreatment, which is a call for generalized action to improve respectful care in healthcare facilities.

In relation to rates of cesarean, we found no differences between nonmigrant and migrant women, whereas previous evidence showed that differences in rates of cesarean in migrant women living in high-income countries compared with nonmigrant women depend on a combination of factors, including country of origin and hosting

TABLE 2 Perceived quality of care by migration status ($n = 16\,472$)[a]

	0.25th centile		0.50th centile (median)		0.75th centile	
	Coefficient (95% CI)	*P* value	Coefficient (95% CI)	*P* value	Coefficient (95% CI)	*P* value
Provision of care						
Nonmigrant	Ref.		Ref.		Ref.	
Migrant	0.00 (−5.62; 5.62)	>0.999	0.00 (−4.49; 4.49)	>0.999	0.00 (−4.70; 4.70)	>0.999
Experience of care						
Nonmigrant	Ref.		Ref.		Ref.	
Migrant	0.00 (−2.16; 2.16)	>0.999	0.00 (−4.88; 4.88)	>0.999	0.00 (−4.68; 4.68)	>0.999
Availability of human and physical resources						
Nonmigrant	Ref.		Ref.		Ref.	
Migrant	0.00 (−3.11; 3.11)	>0.999	0.00 (−1.35; 1.35)	>0.999	0.00 (−1.70; 1.70)	>0.999
Reorganizational changes due to COVID-19 pandemic						
Nonmigrant	Ref.		Ref.		Ref.	
Migrant	0.00 (−1.55; 1.55)	>0.999	0.00 (−1.12; 1.12)	>0.999	0.63 (−5.42; 6.67)	0.840
QMNC index						
Nonmigrant	Ref.		Ref.		Ref.	
Migrant	−4.00 (−8.70; 0.70)	0.095	0.00 (−3.18; 3.18)	>0.999	0.00 (−2.47; 2.47)	>0.999

Abbreviation: QMNC, quality of maternal and newborn care.

[a]95% CIs and *P* values were calculated using robust estimation of standard errors, adjusted for country and for sociodemographic and perinatal confounders (i.e. maternal age, maternal education, type of hospital, type of birth, presence of an obstetrics/gynecology doctor in the team who assisted birth).

country.[9,57] Study data were not analyzed by country of origin or hosting country, and therefore our findings do not include potential specific differences that might have occurred for the prevalence of cesarean between nonmigrants and migrants from different origin countries or hosting countries (e.g. women from Syria living in Germany vs women from France living in Portugal). Additionally, we found no differences between migrant and nonmigrant women for pain relief during labor, whereas previous studies documented that migrant women, especially those from low-income countries, had significantly lower use of epidural analgesia. This could be due to communication problems, since migrant women with a partner from the hosting country were more likely to receive pain relief during childbirth, compared with those with a migrant partner.[58] When there are language barriers and lack of interpretation, patient–provider communication may be reduced to a minimum, with a negative impact on providing adequate information on treatment and meeting women's expectations and needs.[59] However, Byrskog et al.[60] found that migrant women with a community-based bilingual doula present during childbirth used less pain relief compared with nonmigrant women, which could be interpreted as improved management of pain or missing out on available pain relief. Razum et al.[61] found that, among second generation migrants, receiving appropriate neuraxial anesthesia for vaginal births and for cesarean (instead of general anesthesia) was independent of migration status, whereas first generation migrants with low local language skills or low educational level had lower chances of receiving neuraxial anesthesia for vaginal births. After cesarean, migrant women in our study were more likely not to receive adequate pain relief compared with nonmigrant women. Future studies analyzing in depth women's perspectives and beliefs on pain relief could identify determinants of pain relief during labor, birth, and postpartum if and when it is wanted.

Migrant women were slightly more likely to report that they were not allowed to stay with their baby as they wished and were more likely to report early breastfeeding compared with nonmigrant women who experienced labor. Rooming-in promotes mother–infant bonding[62] and moderates individual risk factors for postpartum depression.[63] Thus, denying a woman's right to stay with her baby can have a negative effect not only on the mother, but also on the baby and the mother–infant relationship.[62] Regardless, migrant women were more likely to initiate early breastfeeding compared with nonmigrant women, which is reassuring for mother–infant interactions. In some European countries, exclusive breastfeeding rates for the first day in hospital are high for both migrant and nonmigrant women, with migrant women more likely to breastfeed exclusively.[64] Additionally, qualitative studies have reported that migrant women perceived guidance on breastfeeding practices to be good and helpful after birth.[52]

Migrant women were more likely to perceive inadequate room comfort and equipment, an inadequate number of women per room, and were less likely to have provided informal payments. Possible explanations for migrant women's dissatisfaction with healthcare facilities in our study may be because, in general, the sample was comprised of highly educated women who may have

had high expectations of facilities providing maternal and newborn health care in middle/high-income countries.

Finally, our data show that migrant women who gave birth in Croatia, Portugal, Slovenia, and Sweden reported significantly lower QMNC compared with nonmigrant women for specific subdomains of the QMNC, whereas the opposite occurred in Luxembourg. This shows that differences in health care between migrant and nonmigrant women are highly dependent on the hosting country, which has been identified previously for specific aspects of maternal health care.[9,57] To understand these differences, qualitative studies with mothers and healthcare providers could inform factors that determine uptake and quality of care for migrant women in specific countries. However, these differences were not significant after adjustments for relevant factors, indicating gaps in the QMNC for all women, regardless of migration status, and need for overall improvements in the provision of care.

A limitation of the present study is that about one-third of the participants (both migrants and nonmigrant) were from northern European countries and had a relatively high level of education compared with that expected in the overall general population, and especially among migrants. Higher educational levels could be associated with better access to high QMNC for both migrants and nonmigrant women, but could also be associated with higher expectations compared to migrant and nonmigrant women with lower education levels. We acknowledge the complexity of the nonmigrant and migrant population in Europe, and that women with lower educational level, lower socioeconomic background, and/or at greater distress may have been less likely to answer the questionnaire. Additionally, despite the large sample size in the current study, we did not compare the total number of births in the various countries and the numbers of participants in this study by migrant status, therefore we cannot report on bias nor assume that the sample is representative of the population. Studies with more representative samples of the most vulnerable migrants from recent conflict areas, or from southern European countries where there are recent emerging migration flows and social and demographic conditions are less favorable, may have yielded different results.

According to the International Organization for Migration[35] there is no universal consensus on the definition of "migrant" and, in this study, we defined migrant as a woman giving birth in a foreign country, i.e. not in the country in which she was born. As we did not have information on how long ago these women moved from their country of origin and how long they were living in the country where they gave birth, we are unable to elucidate the potential effects of acculturation. We did not collect information on the legal resident status of the women, their partner, or family members (e.g. refugee or asylum seekers, or those with temporary vs permanent residency status) and therefore we are unable to discern the impact of documented status on perception of QMNC. We also did not examine the association between QMNC and individual factors, such as migrant women's acculturation or understanding of the local language, and specific indicators such as communication with healthcare providers. Further analysis on the association between sociodemographic characteristics and specific indicators of QMNC will be provided in future publications. Finally, we do not know whether women were COVID-19 positive specifically at the time of childbirth, which could explain differences in several quality measures since there were specific restrictions and denials of women's rights in those cases. Nonetheless, in our sample a similar proportion of migrant and nonmigrant women (3.8% vs 3.6%) had COVID-19 at some point during pregnancy, childbirth, or postpartum so this does not fully explain the differential in QMNC scores. Future studies analyzing QMNC from the perspectives of women with COVID-19 during the perinatal period, regardless of their migrant status, would be of great interest.

In conclusion, gaps in overall QMNC were reported by both migrant and nonmigrant women, showing that improvements to health care are necessary for all. Continuous monitoring of QMNC for both migrant and nonmigrant women in Europe is important to improve healthcare for all and improve women's experiences. Migrant issues are especially relevant in a transforming Europe with reshaped migration flows due to the COVID-19 pandemic and to a migration crisis related to violent armed conflicts in Eastern Europe. Urgent actions are needed to understand how health care operates for migrants within the WHO European Region, to improve QMNC for all women, and to develop migrant-friendly health systems that incorporate the needs of migrants into health care by attending to cultural and socioeconomic specificities to achieve equity and healthier societies.

AUTHOR CONTRIBUTIONS

RC wrote the first draft, with major inputs from all authors. ML conceived the study, with major inputs from EPV, BC, and additional input from all other authors. IM analyzed the data, with major inputs from RC, CR, HD, CB, ML, EV, BC, IC, RA, KL, HE, MZ, MA, ES, LW, VR, and CM. All authors developed and promoted the surveys, contributed to data collection, and approved the final version of the manuscript.

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CONFLICT OF INTEREST

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IMAgiNE EURO STUDY GROUP

Bosnia and Herzegovina: Amira Ćerimagić, NGO Baby Steps, Sarajevo; **Croatia:** Daniela Drandić, Roda – Parents in Action, Zagreb; Magdalena Kurbanović, Faculty of Health Studies, University of Rijeka, Rijeka; **France:** Rozée Virginie, Elise de La Rochebrochard, Sexual and Reproductive Health and Rights Research Unit, Institut National d'Études Démographiques (INED), Paris; Kristina Löfgren, Baby-friendly Hospital Initiative (IHAB); **Germany:** Céline Miani, Stephanie Batram-Zantvoort, Lisa Wandschneider, Department of Epidemiology and International Public Health, School of Public Health, Bielefeld University, Bielefeld; **Italy:** Marzia Lazzerini, Emanuelle Pessa Valente, Benedetta Covi, Ilaria Mariani, Institute for Maternal and Child Health IRCCS "Burlo Garofolo", Trieste; Sandra Morano, Medical School and Midwifery School, Genoa University, Genoa; **Israel:** Ilana Chertok, Ohio University, School of Nursing, Athens, Ohio, USA and Ruppin Academic Center, Department of Nursing, Emek Hefer; Rada Artzi-Medvedik, Department of Nursing, The Recanati School for Community Health Professions, Faculty of Health Sciences at Ben-Gurion University (BGU) of the Negev; **Latvia:** Elizabete Pumpure, Dace Rezeberga, Gita Jansone-Šantare, Department of Obstetrics and Gynecology, Riga Stradins University and Riga Maternity Hospital, Riga; Dārta Jakovicka, Faculty of Medicine, Riga Stradins University, Rīga; Agnija Vaska, Riga Maternity Hospital, Riga; Anna Regīna Knoka, Faculty of Medicine, Riga Stradins University, Rīga; Katrīna Paula Vilcāne, Faculty of Public Health and Social Welfare, Riga Stradins University, Riga; **Lithuania:** Alina Liepinaitienė, Andželika Kondrakova, Kaunas University of Applied Sciences, Kaunas; Marija Mizgaitienė, Simona Juciūtė, Kaunas Hospital of the Lithuanian University of Health Sciences, Kaunas; **Luxembourg:** Maryse Arendt, Professional Association of Lactation Consultants in Luxembourg; Barbara Tasch, Professional Association of Lactation Consultants in Luxembourg and Neonatal Intensive Care Unit, KannerKlinik, Centre Hospitalier de Luxembourg, Luxembourg; **Norway:** Ingvild Hersoug Nedberg, Sigrun Kongslien, Department of Community Medicine, UiT The Arctic University of Norway, Tromsø; Eline Skirnisdottir Vik, Department of Health and Caring Sciences, Western Norway University of Applied Sciences, Bergen; **Poland:** Barbara Baranowska, Urszula Tataj-Puzyna, Maria Węgrzynowska, Department of Midwifery, Centre of Postgraduate Medical Education, Warsaw; **Portugal:** Raquel Costa, EPIUnit - Instituto de Saúde Pública, Universidade do Porto, Porto; Laboratório para a Investigação Integrativa e Translacional em Saúde Populacional, Porto; Lusófona University/HEI-Lab: Digital Human-environment Interaction Labs, Lisbon; Catarina Barata, Instituto de Ciências Sociais, Universidade de Lisboa; Teresa Santos, Universidade Europeia, Lisbon and Plataforma CatólicaMed/Centro de Investigação Interdisciplinar em Saúde (CIIS) da Universidade Católica Portuguesa, Lisbon; Carina Rodrigues, EPIUnit - Instituto de Saúde Pública, Universidade do Porto, Porto and Laboratório para a Investigação Integrativa e Translacional em Saúde Populacional, Porto; Heloísa Dias, Regional Health Administration of the Algarve; **Romania:** Marina Ruxandra Otelea, University of Medicine and Pharmacy Carol Davila, Bucharest and SAMAS Association, Bucharest; **Serbia:** Jelena Radetić, Jovana Ružičić, Centar za mame, Belgrade; **Slovenia:** Zalka Drglin, Barbara Mihevc Ponikvar, Anja Bohinec, National Institute of Public Health, Ljubljana; **Spain:** Serena Brigidi, Department of Anthropology, Philosophy and Social Work, Medical Anthropology Research Center (MARC), Rovira i Virgili University (URV), Tarragona; Lara Martín Castañeda, Institut Català de la Salut, Generalitat de Catalunya; **Sweden:** Helen Elden, Verena Sengpiel, Institute of Health and Care Sciences, Sahlgrenska Academy, University of Gothenburg and Department of Obstetrics and Gynecology, Region Västra Götaland, Sahlgrenska University Hospital, Gothenburg; Karolina Linden, Institute of Health and Care Sciences, Sahlgrenska Academy, University of Gothenburg; Mehreen Zaigham, Department of Obstetrics and Gynecology, Institution of Clinical Sciences Lund, Lund University, Lund and Skåne University Hospital, Malmö; **Switzerland:** Claire de Labrusse, Alessia Abderhalden, Anouck Pfund, Harriet Thorn, School of Health Sciences (HESAV), HES-SO University of Applied Sciences and Arts Western Switzerland, Lausanne; Susanne Grylka-Baeschlin, Michael Gemperle, Antonia N. Mueller, Research Institute of Midwifery, School of Health Sciences, ZHAW Zurich University of Applied Sciences, Winthertur.

DATA AVAILABILITY STATEMENT

Data can be made available on reasonable request to the corresponding author.

DISCLAIMER

The authors alone are responsible for the views expressed in this article and they do not necessarily represent the views, decisions, or policies of the institutions with which they are affiliated.

ORCID

Raquel Costa https://orcid.org/0000-0003-1614-540X
Carina Rodrigues https://orcid.org/0000-0003-1720-2808
Benedetta Covi https://orcid.org/0000-0001-7635-0654
Ilaria Mariani https://orcid.org/0000-0001-8260-4788
Emanuelle Pessa Valente https://orcid.org/0000-0002-4741-4628
Mehreen Zaigham https://orcid.org/0000-0003-0129-1578
Eline Skirnisdottir Vik https://orcid.org/0000-0002-9472-5947
Susanne Grylka-Baeschlin https://orcid.org/0000-0001-5652-6886
Maryse Arendt https://orcid.org/0000-0002-0523-3837
Teresa Santos https://orcid.org/0000-0001-9947-6022
Daniela Drandić https://orcid.org/0000-0003-3119-7734
Jelena Radetic https://orcid.org/0000-0003-1267-374X
Virginie Rozée https://orcid.org/0000-0003-0288-982X
Helen Elden https://orcid.org/0000-0003-0000-0476
Céline Miani https://orcid.org/0000-0003-3835-0287
Jovana Ruzicic https://orcid.org/0000-0002-3772-4155
Karolina Linden https://orcid.org/0000-0002-2792-3142
Claire de Labrusse https://orcid.org/0000-0001-9885-5135
Stephanie Batram-Zantvoort https://orcid.org/0000-0002-3948-9777
Barbara Mihevc Ponikvar https://orcid.org/0000-0003-3993-7979
Emma Sacks https://orcid.org/0000-0003-0743-7208
Marzia Lazzerini https://orcid.org/0000-0001-8608-2198

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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