

Impact of the COVID-19 pandemic on maternity services in Europe: a mixed methods systematic review protocol

Harriet Thorn-Cole • Claire De Labrusse • Alessia Abderhalden-Zellweger • Christelle Kaech • Raphaël Hammer

HESAV School of Health Sciences, HES-SO University of Applied Sciences and Arts Western Switzerland, Lausanne, Switzerland

ABSTRACT

Objective: This review will synthesize and integrate the best available evidence on the changes caused by the COVID-19 pandemic in access to and the provision of maternity services in Europe. The review will also consider health care professionals' experiences in providing maternity care during the COVID-19 pandemic in Europe.

Introduction: Governments and maternity services have introduced various protective sanitary and organizational measures to reduce the spread of COVID-19 and protect the global population, including health care professionals. Since March 2020, the number of publications on this topic has soared, yet little is known about the effect of the pandemic and the accompanying measures on access to and the provision of maternity care in Europe.

Inclusion criteria: The review will consider quantitative, qualitative, and mixed methods studies on the impact of COVID-19 on European maternity services. For the quantitative component, the review will consider studies evaluating maternity services outcomes across all types of maternity care settings. For the qualitative component, the review will consider studies exploring maternity health care providers' experiences and perceptions of the impact of the pandemic on care provided to women and their babies.

Methods: Six bibliographic databases will be searched for published and unpublished studies since March 2020. Study selection, critical appraisal, data extraction, and data synthesis will follow JBI's segregated mixed methods approach. The quantitative component will be adapted to follow the JBI requirements for systematic reviews of etiology and risk.

Systematic review registration number: PROSPERO CRD42021283878

Keywords: COVID-19 pandemic; maternity care provision; maternity health care professionals; maternity services; mixed methods

JBI Evid Synth 2022; 20(9):2303–2311.

Introduction

In March 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic.¹ This pandemic has had a major impact on the global population, given that the SARS-CoV2 virus spreads rapidly and has caused many hospitalizations and deaths. The pandemic has affected people's lives—not only through infections of COVID-19 but also through the measures taken by governments to restrict movement and social contact to reduce the spread of the virus.² Maternity

care services, in line with government directives, have also introduced sanitary measures to manage the spread of the virus and to protect staff, pregnant women, and their babies.³ These measures include the exclusion of partners from face-to-face antenatal and postnatal appointments, the instauration of telehealth consultations, the prohibition of visitors, sometimes giving birth without the presence of a partner, and the cancellation of parent education classes or birth afterthoughts sessions.⁴ Some studies describe these measures as antithetical to human-rights care approaches, such as person-centered care, arguing that they isolate women from their support networks.^{5,6} However, pregnant women positively judged some of these measures. For example, some measures resulted in shorter waiting times before

Correspondence: Harriet Thorn-Cole, harriet.emma.cole@gmail.com

The authors declare no conflict of interest.

DOI: 10.11124/JBIES-22-00002

antenatal appointments, while measures restricting visitors during the women's hospital stay allowed breastfeeding women to feel more relaxed and comfortable.⁷ The COVID-19 pandemic has affected not only women, but also maternity health care professionals (HCPs). Midwives and obstetricians have reported a transformation in their relationship with women,⁸ and being overwhelmed by the rapid changes in practice guidelines.⁹ In addition to the changes in the quality of care provided, the workload and the swift adjustment to protocols, priorities, and staffing levels have become a significant issue for managers and frontline workers alike.^{10,11} On an individual level, maternity HCPs have been concerned about contracting and transmitting the disease, burnout, loneliness, and a shift in their work-life balance.^{12,13}

Along with the increase in workload and stress in maternity care, some researchers have reported a reduction in women accessing maternity care, in contrast to prior to the pandemic. Some obstetrics and gynecology emergency services have reported a decrease in emergency admissions,¹⁴ early postpartum discharges being preferred,¹⁵ and a small but growing proportion of women opting for homebirth or freebirth.^{16,17} While the impact of the COVID-19 pandemic on pregnant women and mothers has received much attention, the impact on maternity services and HCPs has been less investigated.¹⁸

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and *JBI Evidence Synthesis* revealed 1 scoping review and 3 similar systematic reviews. Spanning a short time frame (December 2020 to February 2021), the scoping review described the impact of COVID-19 on maternity staff in terms of structural challenges and mental strain.¹⁹ The systematic review, published in 2021, included 56 observations studies and research letters containing primary data on the changes in maternity service usage worldwide.²⁰ The authors carried out a meta-analysis and showed a global reduction in the number of planned and emergency antenatal and postnatal care visits, and an increase in remote consultations. In addition, the rates of hospital admissions after seeking emergency care have fallen, as women around the world delayed seeking labor care at their planned place of birth. The 2 other systematic reviews are protocols for qualitative evidence synthesis. The first covers women's and maternity HCPs' views and experiences of care during COVID-19,²¹ while the other deals with midwives',

nurses', and women's experiences of labor care during the pandemic.²² Both protocols indicate that the reviews will also include studies from countries worldwide. Consequently, they will be comparing experiences and views from maternity HCPs from significantly different political, economic, and geographic contexts and health care systems. However, the heterogeneity of countries or regions in terms of income levels, the epidemiological impact of the pandemic, health care systems, and health policy responses has been identified as a significant limitation in the analysis and transferability of findings.¹⁹ We have, therefore, decided to focus on European countries, which overall have been similarly affected by the pandemic and whose health systems have managed the crisis in a similar manner.⁸

Despite the growing body of literature on the impact of COVID-19 on maternity care, there is no systematic review focusing on maternity care services access and provision nor on HCPs' experiences during the pandemic at a European level. By synthesizing and integrating qualitative and quantitative data, this proposed mixed methods systematic review (MMSR) will not only inform practices of European maternity HCPs, but will also support policy makers in how to adequately manage maternity services in case of future epidemics or pandemics.

Review questions

- i) How has the COVID-19 pandemic affected access to and the provision of maternity services in Europe?
- ii) What are the experiences of frontline HCPs providing maternity care to women and their newborns during the COVID-19 pandemic in Europe?

Inclusion criteria

Participants

For the quantitative component, the review will consider studies on all health services providing maternity care to pregnant women and their newborns, regardless of their sociodemographic or risk profiles. The review will consider community services as well as hospital services, ranging from small regional hospitals to large tertiary referral centers. For the qualitative component, the review will only consider studies on the experiences of frontline maternity HCPs providing antenatal, intrapartum, and

postpartum (up to 6 weeks' postnatal) care. Front-line maternity HCPs are defined as professionals employed by maternity services and directly providing care to women and their babies. They include midwives, obstetricians, anesthetists, neonatologists, and neonatal nurses.

Exposure of interest

The exposure of interest is the COVID-19 pandemic.

Outcomes

The quantitative component of this review will consider studies that include the following outcomes: maternal care bookings, maternity hospital admissions, emergency care admissions, neonatal intensive care unit (NICU) admissions, face-to-face antenatal and postnatal appointments, telehealth appointments, cancellations of birth afterthoughts appointments, cancellation of breastfeeding support, cancellation of parent education classes, staffing levels, staff in quarantine, absenteeism, and job resignation. In addition, studies exploring the mean hospital stay and NICU stay durations will be of interest.

Phenomena of interest

The qualitative component of this review will consider studies that investigate maternity HCPs' experiences regarding the impact of the COVID-19 pandemic on the care provided to women and their babies. This may include maternity HCPs' perceptions of their professional work environment as well as their coping and adaptive strategies.

Context

The review will consider studies carried out in European maternity care settings.

Types of studies

This review will consider quantitative, qualitative, and mixed methods studies. Research letters or commentaries will be excluded. Quantitative studies will include observational and cross-sectional studies. Qualitative studies will include any articles reporting primary empirical research using qualitative data collection (eg, individual interviews, focus groups, participant observation) and interpretive data analysis. We will consider qualitative studies regardless of their theoretical orientation, such as descriptive, ethnography, phenomenology, grounded theory, action

research, or feminist research. The review will also include studies containing qualitative data in the form of open-ended responses collected via quantitative techniques such as surveys. Mixed methods studies will be considered if the quantitative data are related to maternity services outcomes and/or if qualitative components are related to maternity HCPs' perspective and can be clearly extracted.

Methods

The proposed review will be conducted in accordance with the JBI methodology for MMSR.²³ Usually, this type of review seeks to answer questions of effectiveness and of lived experiences. However, for the quantitative component of this MMSR, the review will evaluate the impact of an exposure (COVID-19) instead of the effectiveness of an intervention. Therefore, the following MMSR protocol will be adapted to meet the requirements for JBI systematic reviews of etiology and risk.²⁴ The MMSR is registered in PROSPERO (CRD42021283878).

Search strategy

Two separate searches will be conducted, 1 for each component of the review. The search strategy will aim to locate published and unpublished studies. An initial limited search of PubMed, Embase, and CINAHL was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles, were used to develop a full search strategy for PubMed (see Appendix I). The search strategy, including all identified keywords and index terms, will be adapted for each included database and/or information source. The reference lists of all studies selected for critical appraisal will be screened for additional studies. Studies written in any language will be considered for inclusion and translated using DeepL (DeepL, Cologne, Germany). Studies from March 2020 till the present will be included. The start date corresponds to the WHO's declaration of the COVID-19 disease as a pandemic.¹ Studies from outside the European region, as defined by the WHO, will be excluded.

The databases to be searched will include Embase, PubMed, CINAHL (EBSCO), PsycINFO, Scopus, and Web of Science (Web of Science Core Collection; Current Contents Connect). We will also search for published and unpublished studies via colleagues

and experts and conduct a free web search in Google Scholar.

Study selection

Following the search, all identified citations will be collated and uploaded into EndNote v.20 (Clarivate Analytics, PA, USA) and duplicates removed. Following a pilot test, 2 independent reviewers will screen titles and abstracts against the inclusion criteria for the review using Rayyan (Qatar Computing Research Institute, Doha, Qatar). Potentially relevant studies will be retrieved in full and their citation details imported into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; JBI, Adelaide, Australia).²⁵

The full text of selected citations will be assessed in detail against the inclusion criteria by 2 independent reviewers. Reasons for exclusion of full-text studies that do not meet the inclusion criteria will be recorded and reported in the systematic review. Any disagreements that arise between the reviewers at each stage of the study selection process will be resolved through discussion or with a third reviewer. The results of the search will be reported in full in the final review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.²⁶

Assessment of methodological quality

Eligible quantitative papers (and the quantitative component of mixed methods papers) will be critically appraised by 2 independent reviewers at the study level for methodological quality. We will use standardized critical appraisal instruments for observational and descriptive study designs, and analytical observational studies available in JBI SUMARI.^{23,24} Qualitative papers (and the qualitative component of mixed methods papers) selected for retrieval will be assessed by 2 independent reviewers for methodological validity prior to inclusion in the review using the standardized critical appraisal instrument for qualitative research available in JBI SUMARI.²⁵

Authors of papers will be contacted to request missing or additional data for clarification, where required. Following critical appraisal, studies that do not meet a certain quality threshold will be excluded. To be considered of adequate quality, studies must achieve a minimum of 60% “yes” responses to the quality appraisal questions. Any disagreements that arise between the reviewers will be resolved through

discussion or with a third reviewer. The results of critical appraisal will be reported in narrative format and in a table.

Data extraction

For the quantitative component, data will be extracted from quantitative and mixed methods (quantitative component only) studies by 2 independent reviewers using the standardized JBI data extraction tool in JBI SUMARI.²⁵ The data extracted will include specific details about the country, maternity service type/setting, study methods, exposure and control study periods, and outcomes of significance to the first review question.

For the qualitative component, data will be extracted from qualitative and mixed methods (qualitative component only) studies included in the review by 2 independent reviewers using the standardized JBI data extraction tool in JBI SUMARI.²⁵ The data extracted will include specific details about the population, context, culture, country, study methods, and the phenomena of interest relevant to the second review question. The findings and their illustrations will be extracted verbatim and assigned a level of credibility.

Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer. Authors of papers will be contacted to request missing or additional data, where required.

Data synthesis and integration

This review will follow a convergent segregated approach to synthesis and integration according to the JBI methodology for MMSR using JBI SUMARI.²³ This will involve separate quantitative and qualitative synthesis followed by integration of the resultant quantitative and qualitative evidence.

Studies will, where possible, be pooled in statistical meta-analysis using JBI SUMARI. Effect sizes expressed as relative risk (for dichotomous data) or weighted mean differences (for continuous data) and their 95% CIs will be calculated for analysis. Where effect estimates and standard errors are not available, they will be calculated from crude data and 95% CIs. A random effects model will be generated given the likelihood of heterogeneity among observation studies of various types of maternity services across Europe, following the DerSimonian and Laird method. Heterogeneity will be assessed statistically using the standard χ^2 and I^2 tests.

Subgroup analyses will be conducted where there is sufficient data to investigate differences in the effects between northern and western European countries and southern and eastern European countries. Sensitivity analyses will be conducted to test decisions made regarding the inclusion of unpublished studies in the meta-analysis. A funnel plot will be generated to assess publication bias if there are 10 or more studies included in a meta-analysis. Statistical tests for funnel plot asymmetry (Egger test, Begg test, Harbord test) will be performed where appropriate.

Where meta-analysis is not possible, the findings will be presented in narrative format, including tables and figures to aid in data presentation, following the Synthesis Without Meta-Analysis (SWiM) guideline.²⁷

Qualitative research findings will, where possible, be pooled using JBI SUMARI with the meta-aggregation approach.²⁸ This will involve the aggregation or synthesis of findings to generate a set of statements that represent that aggregation, through assembling the findings and categorizing these based on similarity in meaning. These categories will then be subjected to a synthesis to produce a comprehensive set of synthesized findings that can be used as a basis for evidence-based practice. Where textual pooling is not possible, the findings will be presented in narrative format. Only unequivocal and credible findings will be included in the synthesis.

The findings of each single method synthesis included in this review will then be configured. The integration will be initiated by attempting to answer the adapted trigger questions (see Appendix II), involving the juxtaposition and organization of quantitative and qualitative evidence to produce an overall configured analysis. Where configuration is not possible, the findings will be presented in narrative form.

Acknowledgments

Magali Serex, the HESAV School of Health Sciences, HES-SO University of Applied Sciences and Arts Western Switzerland librarian, for her guidance in defining the search terms and search strings for the database searches.

Author contributions

HT-C was involved in the conceptualization, methodology, validation, and writing (both the original draft and revisions), supervision, and project administration. CDL was involved in the conceptualization,

writing (revisions), and supervision. AA and CK contributed toward the writing (revisions). RH was involved in the conceptualization, methodology, validation, writing (both the original draft and revisions), and supervision.

References

1. World Health Organization. WHO Director-General's opening remarks at the media briefing on COVID-19-11 March 2020 [internet]. WHO; 2020 [cited 2021 Mar 1]. Available from: <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020>.
2. Hale T, Angrist N, Goldszmidt R, Kira B, Petherick A, Phillips T, et al. A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). *Nat Hum Behav* 2021;5(4):529–38.
3. Montagnoli C, Zanconato G, Ruggeri S, Cinelli G, Tozzi AE. Restructuring maternal services during the COVID-19 pandemic: early results of a scoping review for non-infected women. *Midwifery* 2021;94:102916.
4. Węgrzynowska M, Doroszevska A, Witkiewicz M, Baranowska B. Polish maternity services in times of crisis: in search of quality care for pregnant women and their babies. *Health Care Women Int* 2020;41(11–12):1335–48.
5. Labrusse CD, Ramelet AS, Humphrey T, MacLennan S. Patient-centred care in maternity services. In: Saylignil O, editor. Patient centered medicine [internet]. London: IntechOpen; 2017 [cited 2022 Jul 17]. Available from: <https://www.intechopen.com/chapters/54225>.
6. Lalor J, Ayers S, Celleja Agius J, Downe S, Gouni O, Hartmann K, et al. Balancing restrictions and access to maternity care for women and birthing partners during the COVID-19 pandemic: the psychosocial impact of suboptimal care. *BJOG* 2021;128(11):1720–5.
7. Panda S, O'Malley D, Barry P, Vallejo N, Smith V. Women's views and experiences of maternity care during COVID-19 in Ireland: a qualitative descriptive study. *Midwifery* 2021; 103:103092.
8. Coxon K, Turienzo CF, Kweekel L, Goodarzi B, Brigante L, Simon A, et al. The impact of the coronavirus (COVID-19) pandemic on maternity care in Europe. *Midwifery* 2020; 88:102779.
9. Asefa A, Semaan A, Delvaux T, Huysmans E, Galle A, Sacks E, et al. The impact of COVID-19 on the provision of respectful maternity care: findings from a global survey of health workers. *Women Birth* 2022;35(4):378–86.
10. Sumner RC, Kinsella EL. "It's like a kick in the teeth": the emergence of novel predictors of burnout in frontline workers during COVID-19. *Front Psychol* 2021;12:1875.
11. Fisher E, Cárdenas L, Kieffer E, Larson E. Reflections from the "forgotten front line": a qualitative study of factors affecting wellbeing among long-term care workers in New York City

- during the COVID-19 pandemic. *Geriatr Nurs* 2021;42(6):1408–14.
12. González-Timoneda A, Hernández Hernández V, Pardo Moya S, Alfaro Blazquez R. Experiences and attitudes of midwives during the birth of a pregnant woman with COVID-19 infection: a qualitative study. *Women Birth* 2021;34(5):465–72.
 13. Hantoushzadeh S, Bagheri M, Amjadi MA, Farahani MF, Haghollahi F. Experiences of health care providers on pregnancy and childbirth care during the COVID-19 pandemic in Iran: a phenomenological study. *BMC Pregnancy Childbirth* 2021;21(1):670.
 14. Gomez D, Simpson AN, Sue-Chue-Lam C, de Mestral C, Dossa F, Nantais J, et al. A population-based analysis of the impact of the COVID-19 pandemic on common abdominal and gynecological emergency department visits. *CMAJ* 2021;193(21):E753–60.
 15. Bornstein E, Gulersen M, Husk G, Grunebaum A, Blitz MJ, Rafael TJ, et al. Early postpartum discharge during the COVID-19 pandemic. *J Perinat Med* 2020;48(9):1008–12.
 16. Romanis EC, Nelson A. Homebirthing in the United Kingdom during COVID-19. *Med Law Int* 2020;20(3):183–200.
 17. Schröder K, Stokholm L, Rubin KH, Jørgensen JS, Nohr EA, Petersen LK, et al. Concerns about transmission, changed services and place of birth in the early COVID-19 pandemic: a national survey among Danish pregnant women. The COVIDPregDK study. *BMC Pregnancy Childbirth* 2021;21(1):664.
 18. Kotlar B, Gerson E, Petrillo S, Langer A, Tiemeier H. The impact of the COVID-19 pandemic on maternal and perinatal health: a scoping review. *Reprod Health* 2021;18(1):10.
 19. Schmitt N, Mattern E, Cignacco E, Seliger G, König-Bachmann M, Striebich S, et al. Effects of the COVID-19 pandemic on maternity staff in 2020 - a scoping review. *BMC Health Serv Res* 2021;21(1):1364.
 20. Townsend R, Chmielewska B, Barratt I, Kalafat E, van der Meulen J, Gurol-Urganci I, et al. Global changes in maternity care provision during the COVID-19 pandemic: a systematic review and meta-analysis. *EClinicalMedicine* 2021;37:100947.
 21. Smith V, Flaherty S-J, Matvienko-Sikar K, Delaney H. Maternity care during COVID-19: a protocol for a qualitative evidence synthesis of women's and maternity care providers' views and experiences. *HRB Open Res* 2021;4:21.
 22. Macdonald D, Snelgrove-Clarke E, Ross-White A, Bigelow-Talbert K. Experiences of birthing care during COVID-19: a systematic review protocol. *JBIM Evid Synth* 2022. Epub ahead of print.
 23. Lizarondo L, Stern C, Carrier J, Godfrey C, Rieger K, Salmond S, et al. Chapter 8: Mixed methods systematic reviews. In: Aromataris E, Munn Z, editors. *JBIM Manual for Evidence Synthesis* [internet]. Adelaide: JBI; 2020 [cited 2021 Oct 26]. Available from: <https://synthesismanual.jbi.global>.
 24. Moola S, Munn Z, Tufanaru C, Aromataris E, Sears K, Sfetcu R, et al. Chapter 7: Systematic reviews of etiology and risk. In: Aromataris E, Munn Z, editors. *JBIM Manual for Evidence Synthesis* [internet]. Adelaide: JBI; 2020 [cited 2021 Nov 29]. Available from: <https://synthesismanual.jbi.global>.
 25. Munn Z, Aromataris E, Tufanaru C, Stern C, Porritt K, Farrow J, et al. The development of software to support multiple systematic review types: the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information (JBI SUMARI). *Int J Evid Based Healthc* 2019;17(1):36–43.
 26. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Int J Surg* 2021;372:n71.
 27. Campbell M, McKenzie JE, Sowden A, Katikireddi SV, Brennan SE, Ellis S, et al. Synthesis without meta-analysis (SWiM) in systematic reviews: reporting guideline. *BMJ* 2020;368:l6890.
 28. Lockwood C, Munn Z, Porritt K. Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *Int J Evid Based Healthc* 2015;13(3):179–87.

Appendix I: Search strategy

PubMed

Quantitative component

Search conducted on May 19, 2022

Search	Query	Records retrieved
#1	("COVID-19"[tiab] OR "COVID 19"[tiab] OR "SARS-Cov2"[tiab] OR "SARS Cov2 "[tiab] OR "coronavirus"[tiab] OR "corona virus"[tiab] OR "new COVID"[tiab] OR "novel COVID"[tiab] OR "pandemi"[tiab] OR "COVID-19"[Mesh] OR "SARS-CoV-2"[Mesh])	292,545
#2	("Hospitals, Maternity"[Mesh] OR "Maternal Health Services"[Mesh:NoExp] OR "Nurse Midwives"[Mesh] OR "Perinatal Care"[Mesh] OR "Prenatal Care"[Mesh] OR "Maternal-Child Health Services"[Mesh] OR "Intensive Care Units, Neonatal"[Mesh] OR "maternity"[tiab] OR "midwifery"[tiab] OR "midwife"[tiab] OR "midwives"[tiab] OR "obstetric care"[tiab] OR "perinatal care"[tiab] OR "prenatal care"[tiab] OR "antenatal care"[tiab] OR "intrapartum care"[tiab] OR "postnatal care"[tiab] OR "labor care"[tiab] OR "labour care"[tiab] OR "childbirth care"[tiab] OR "perinatal healthcare"[tiab] OR "obstetric healthcare"[tiab] OR "prenatal healthcare"[tiab] OR "antenatal healthcare"[tiab] OR "intrapartum healthcare"[tiab] OR "postnatal healthcare"[tiab] OR "labor healthcare"[tiab] OR "labour healthcare"[tiab] OR "childbirth healthcare"[tiab] OR "perinatal health care"[tiab] OR "obstetric health care"[tiab] OR "prenatal health care"[tiab] OR "antenatal health care"[tiab] OR "intrapartum health care"[tiab] OR "postnatal health care"[tiab] OR "labor health care"[tiab] OR "labour health care"[tiab] OR "childbirth health care"[tiab] OR obstetrician*[tiab] OR "Neonatologists"[Mesh] OR neonatologist*[tiab] OR "Neonatal Intensive Care Unit"[tiab] OR "NICU"[tiab] OR "Newborn Intensive Care Unit"[tiab] OR "Neonatal ICU"[tiab] OR "Newborn ICU"[tiab] OR "Neonatal Care Unit"[tiab] OR "Newborn Care Unit"[tiab] OR "SCBU"[tiab] OR "Special care baby unit"[tiab])	154,938
#3	("Patient Admission"[Mesh] OR "Patient Readmission"[Mesh] OR "Hospitalization"[Mesh:NoExp] OR "Length of Stay"[Mesh] OR "Appointments and Schedules"[Mesh:NoExp] OR "Remote Consultation"[Mesh] OR "Workforce"[Mesh] OR "Personnel Staffing and Scheduling"[Mesh] OR "Absenteeism"[Mesh] OR "Sick Leave"[Mesh] OR "Quarantine"[Mesh] OR "Workload"[Mesh] OR "Burnout, Psychological"[Mesh] OR "Personnel Turnover"[Mesh] OR "booking"[tiab] OR "admission"[tiab] OR "hospitalization"[tiab] OR "hospitalisation"[tiab] OR "unscheduled"[tiab] OR "appointment"[tiab] OR "unplanned"[tiab] OR "unexpected"[tiab] OR "duration"[tiab] OR "cancellation"[tiab] OR "virtual"[tiab] OR "remote"[tiab] OR "face to face"[tiab] OR "staffing level"[tiab] OR "absenteeism"[tiab] OR "sick leave"[tiab] OR "quarantine"[tiab] OR "job load"[tiab] OR "burnout"[tiab] OR "job resignation"[tiab] OR "Leaving"[tiab] OR "visits"[tiab])	1,817,300
#4	#1 AND #2 AND #3	690
Limited to records published after 2020		656

PubMed

Qualitative component

Search conducted on May 19, 2022

Search	Query	Records retrieved
#1	("COVID-19"[tiab] OR "COVID 19"[tiab] OR "SARS-Cov2"[tiab] OR "SARS Cov2 "[tiab] OR "coronavirus"[tiab] OR "corona virus"[tiab] OR "new COVID"[tiab] OR "novel COVID"[tiab] OR "pandemi"[tiab] OR "COVID-19"[Mesh] OR "SARS-CoV-2"[Mesh])	292,545
#2	("Maternal Health Services"[Mesh:NoExp] OR "Hospitals, Maternity"[Mesh] OR "Infant Health"[Mesh] OR "Parturition"[Mesh] OR "Labor, Obstetric"[Mesh] OR "Maternal Health"[Mesh] OR "Perinatal Care"[Mesh] OR "Prenatal Care"[Mesh] OR "Pregnancy"[Mesh:NoExp] OR "Birthing Centers"[Mesh] OR "Maternal-Child Health Services"[Mesh] OR "Woman health care"[tiab] OR "Woman health service"[tiab] OR "Women health care"[tiab] OR "Women health services"[tiab] OR "newborn health" [tiab] OR "childbirth" [tiab] OR "labour"[tiab] OR "maternal health"[tiab] OR "antenatal care" [tiab] OR "perinatal care"[tiab] OR "prenatal care"[tiab] OR "pregnancy" [tiab] OR "postnatal care"[tiab] OR "newborn care" [tiab] OR "maternity care"[tiab] OR "maternity service"[tiab] OR "homebirth"[tiab] OR "birth center"[tiab] OR "community"[tiab] OR "home birth"[tiab] OR "intrapartum care"[tiab] OR "childbirth care"[tiab])	1,639,395
#3	("Nurse Midwives"[Mesh] OR "Maternal-Child Nursing"[Mesh] OR "Obstetric Nursing"[Mesh] OR "Anesthetists" [Mesh] "Neonatologists"[Mesh] OR "Nurses, Neonatal"[Mesh] OR "maternity care provider"[tiab] OR "maternity staff"[tiab] OR "midwi"[tiab] OR "obstetric"[tiab] OR "maternity physician"[tiab] OR "maternal physician"[tiab] OR "anesthetist"[tiab] OR "neonatologist"[tiab] OR "neonatal nurse"[tiab] OR "maternity healthcare professional"[tiab] OR "perinatal healthcare professional"[tiab] OR "prenatal healthcare professional"[tiab] OR "antenatal healthcare professional"[tiab] OR "intrapartum healthcare professional"[tiab] OR "postnatal healthcare professional"[tiab] OR "labor healthcare professional"[tiab] OR "labour healthcare professional"[tiab] OR "childbirth healthcare professional"[tiab] OR "maternity health care professional"[tiab] OR "maternal health care professional"[tiab] OR "perinatal health care professional"[tiab] OR "prenatal health care professional"[tiab] OR "antenatal health care professional"[tiab] OR "intrapartum health care professional"[tiab] OR "postnatal health care professional"[tiab] OR "labor health care professional"[tiab] OR "labour health care professional"[tiab] OR "childbirth health care professional"[tiab] OR "maternity clinician"[tiab] OR "OB/GYN"[tiab])	143,452
#4	("Attitude of Health Personnel"[Mesh:NoExp] OR "Narration"[Mesh] OR "Anxiety"[Mesh:NoExp] OR "Social Support"[Mesh:NoExp] OR "Resilience, Psychological"[Mesh] OR "Adaptation, Psychological"[Mesh:NoExp] OR "Quality of Health Care"[Mesh:NoExp] OR "Workload"[Mesh] OR "Burnout, Psychological"[Mesh] OR "Stress, Psychological"[Mesh:NoExp] OR "Occupational Stress"[Mesh] OR "Mental Health"[Mesh] OR "Trust"[Mesh] OR "Continuity of Patient Care"[Mesh:NoExp] OR "Health Promotion"[Mesh:NoExp] OR "Decision Making, Shared" [Mesh] OR "Professional Autonomy"[Mesh] OR "Job Satisfaction"[Mesh] OR "Motivation"[Mesh:NoExp] OR "Qualitative Research"[Mesh] OR attitude[tiab] OR experience[tiab] OR perspective[tiab] OR views[tiab] OR voices[tiab] OR perception[tiab] OR narratives[tiab] OR "psychosocial experiences"[tiab] OR anxiety[tiab] OR support[tiab] OR resilience[tiab] OR adaptation[tiab] OR coping [tiab] OR "quality of care"[tiab] OR strategies [tiab] OR challenges[tiab] OR "emotional support"[tiab] OR "emotional impact"[tiab] OR "psychological support"[tiab] OR "psychological impact"[tiab] OR burden[tiab] OR workload[tiab] OR overload[tiab] OR burnout [tiab] OR barriers[tiab] OR stress[tiab] OR "mental health"[tiab] OR resources[tiab] OR "staff shortage"[tiab] OR "midwife-woman relationship"[tiab] OR trust[tiab] OR "continuity of care"[tiab] OR "health promotion"[tiab] OR "shared-decision making"[tiab] OR "professional identity"[tiab] OR autonomy[tiab] OR collaboration[tiab] OR satisfaction[tiab] OR motivation[tiab] OR Qualitative[tiab])	5,455,924
#5	#1 AND #2 AND #3 AND #4	685
Limited to records published after 2020		644

Appendix II: Adapted trigger questions for the integration of the quantitative and qualitative syntheses

- i) Are the results/findings from individual syntheses consistent or discrepant?
- ii) Which aspects of the quantitative results are/are not explored in the qualitative findings?
- iii) Which aspects of the qualitative findings are/are not assessed in the quantitative results?
- iv) Do the qualitative findings contextualize the quantitative results?